The PHOTOFACT Servicer

SET 400 ★ *Published for all users of Howard W. Sams' Photofact Folders* ★ MAY 15, 1958

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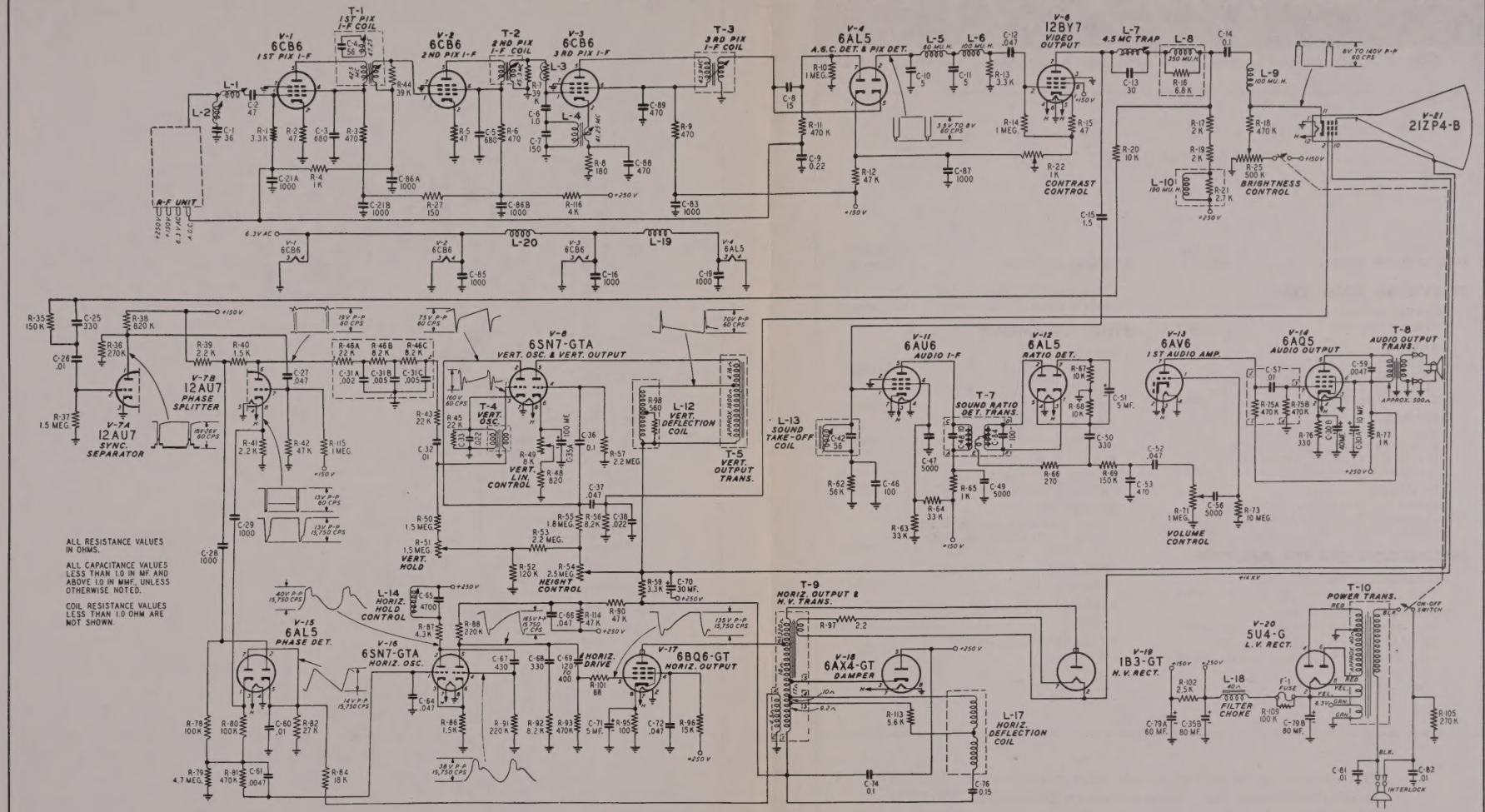
The service information in this Servicer provides data on models which we have been unable to present in PHOTOFACT Folders. The receivers are not in current production; a requirement for PHOTOFACT coverage, and we are therefore presenting schematics and supplementary data that will be of assistance when servicing these models.

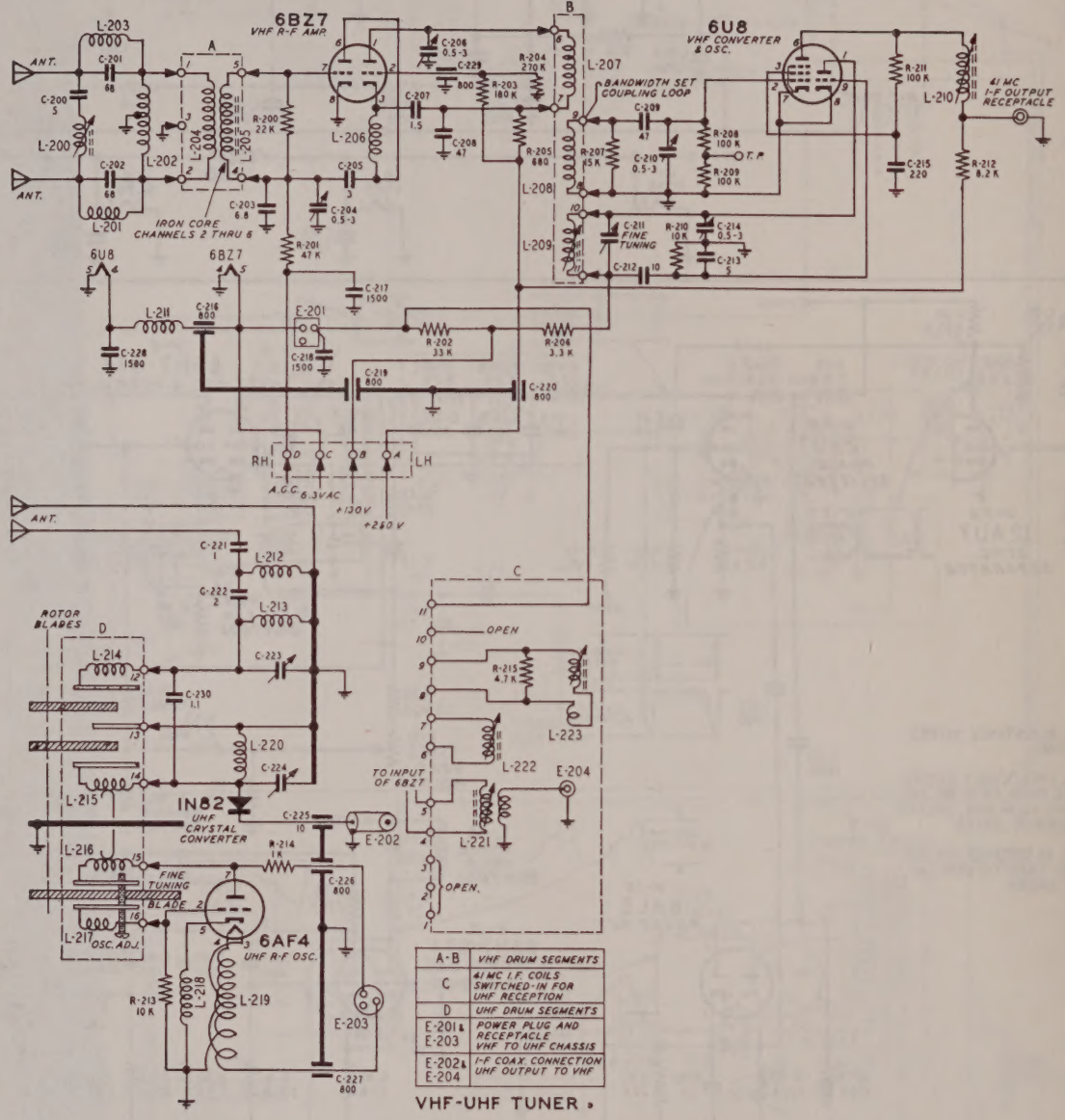
WELLS-GARDNER MODELS 321AM54-A-436, 321AM54-A-470, 2321AM54-A-438, 2321AM54-A-494


V-1 6CB6 1ST PIX I-F
V-2 6CB6 2ND PIX I-F
V-3 6CB6 3RD PIX I-F
V-4 6AL5 A.G.C. DET. & PIX DET.
V-5 12BY7 VIDEO OUTPUT
V-6 6SN7-GTA VERT. OSC. & VERT. OUTPUT
V-7A 12AU7 SYNC. SEPARATOR
V-7B 12AU7 PHASE SPLITTER
V-11 6AU6 AUDIO I-F
V-12 6AL5 RATIO DET.
V-13 6AV6 1ST AUDIO AMP.
V-14 6AQ5 AUDIO OUTPUT
V-15 6AL5 PHASE DET.
V-16 6SN7-GTA HORIZ. OSC.
V-17 6BQ6-GT HORIZ. OUTPUT
V-18 6AX4-GT DAMPER
V-19 1B3-GT H.V. RECT.
V-20 5U4-G L.V. RECT.
V-21 21ZP4-B
T-1 1ST PIX I-F COIL
T-2 2ND PIX I-F COIL
T-3 3RD PIX I-F COIL
T-4 VERT. OSC.
T-5 VERT. OUTPUT TRANS.
T-7 SOUND RATIO DET. TRANS.
T-8 AUDIO OUTPUT TRANS.
T-9 HORIZ. OUTPUT & H.V. TRANS.
T-10 POWER TRANS.
L-12 VERT. DEFLECTION COIL
L-13 SOUND TAKE-OFF COIL
L-14 HORIZ. HOLD CONTROL
L-17 HORIZ. DEFLECTION COIL
L-18 FILTER CHOKE
R-F UNIT
CONTRAST CONTROL
BRIGHTNESS CONTROL
VOLUME CONTROL
VERT. HOLD
VERT. LIN. CONTROL
HEIGHT CONTROL
HORIZ. DRIVE
ALL RESISTANCE VALUES IN OHMS.
ALL CAPACITANCE VALUES LESS THAN 1.0 IN MF. AND ABOVE 1.0 IN MMF. UNLESS OTHERWISE NOTED.
COIL RESISTANCE VALUES LESS THAN 1.0 OHM ARE NOT SHOWN.

NOTE—In early production C-32 was 4700 mmf; R-9 was 1.5 K; R-40 was 3.3 K; R-50 was 3.3 meg. and R-52 was 220 K. In later production C-6 was changed to 1.5 mmf. See parts list.

SCHEMATIC DIAGRAM COURTESY WELLS-GARDNER AND COMPANY

WELLS-GARDNER MODELS 321AM54-A-436, 321AM54-A-470, 2321AM54-A-438, 2321AM54-A-494



A-B	VHF DRUM SEGMENTS
C	41 MC I.F. COILS SWITCHED-IN FOR UHF RECEPTION
D	UHF DRUM SEGMENTS
E-201 & E-203	POWER PLUG AND RECEPTACLE VHF TO UHF CHASSIS
E-202 & E-204	I-F COAX CONNECTION UHF OUTPUT TO VHF

VHF-UHF TUNER »

Fig. 13—Tuner Schematic

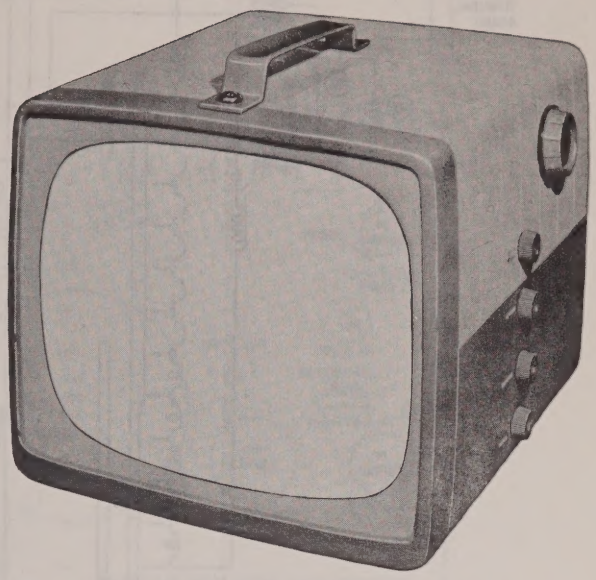
SET 400 FOLDER 1

ARTONE MODELS
14TS78T, 14TS78TA

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove 7 push-on type control knobs.
2. Remove 6 metal screws, 2 antenna leads and rear cover.
3. Remove picture tube socket, ion trap, HV lead and 2 speaker leads.
4. Remove 2 metal screws holding speaker and remove speaker.
5. Remove 2 metal screws holding AC interlock bracket.
6. Remove 2 chassis bolts from bottom.
7. Remove 1 top chassis bolt (middle one in handle).
8. Remove chassis.



CAUTION NOTE

ONE SIDE OF AC LINE CONNECTED TO CHASSIS
Care should be exercised when connecting test equipment or physically contacting the chassis.

TRADE NAME	Artone MODELS 14TS78T, 14TS78TA
SUPPLIER	Affiliated Retailers, 855 Ave. of America, New York, N.Y.
TYPE SET	Television Receiver
TUBES	Thirteen
POWER SUPPLY	110-120 Volts AC, 60 Cycle RATING 115 Watts, 1.4 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13 VHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustments of the VHF tuner oscillator circuit may be accomplished by removing the channel selector and fine tuning knobs. The HIGH band adjustments may be made with the slug located near the right side, the LOW band by slug near the bottom of the tuner. Adjust from highest to lowest channels.

PICTURE TUBE SAFETY GLASS CLEANING

Remove the front handle mounting screw.
Remove 2 metal screws on the bottom, holding the front.
Remove the front of the cabinet.
Remove the clamps holding the safety glass and remove the glass.

FOCUS

Focus may be varied by placement of a strap on the picture tube base between pins 6 and 2 or 6 and 10. Readjust ion trap for best focus consistent with maximum brightness.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

To adjust the horizontal oscillator, remove the rear cover and supply power to the set. Set the horizontal hold control at mid-position and adjust the horizontal frequency slug (B1) until the picture synchronizes horizontally.

FUSES

A 4.7Ω fusible resistor (R68) is used for LV power supply protection.

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings round the neck of the picture tube. Rotate the two rings around the neck of the tube until the picture is properly centered.

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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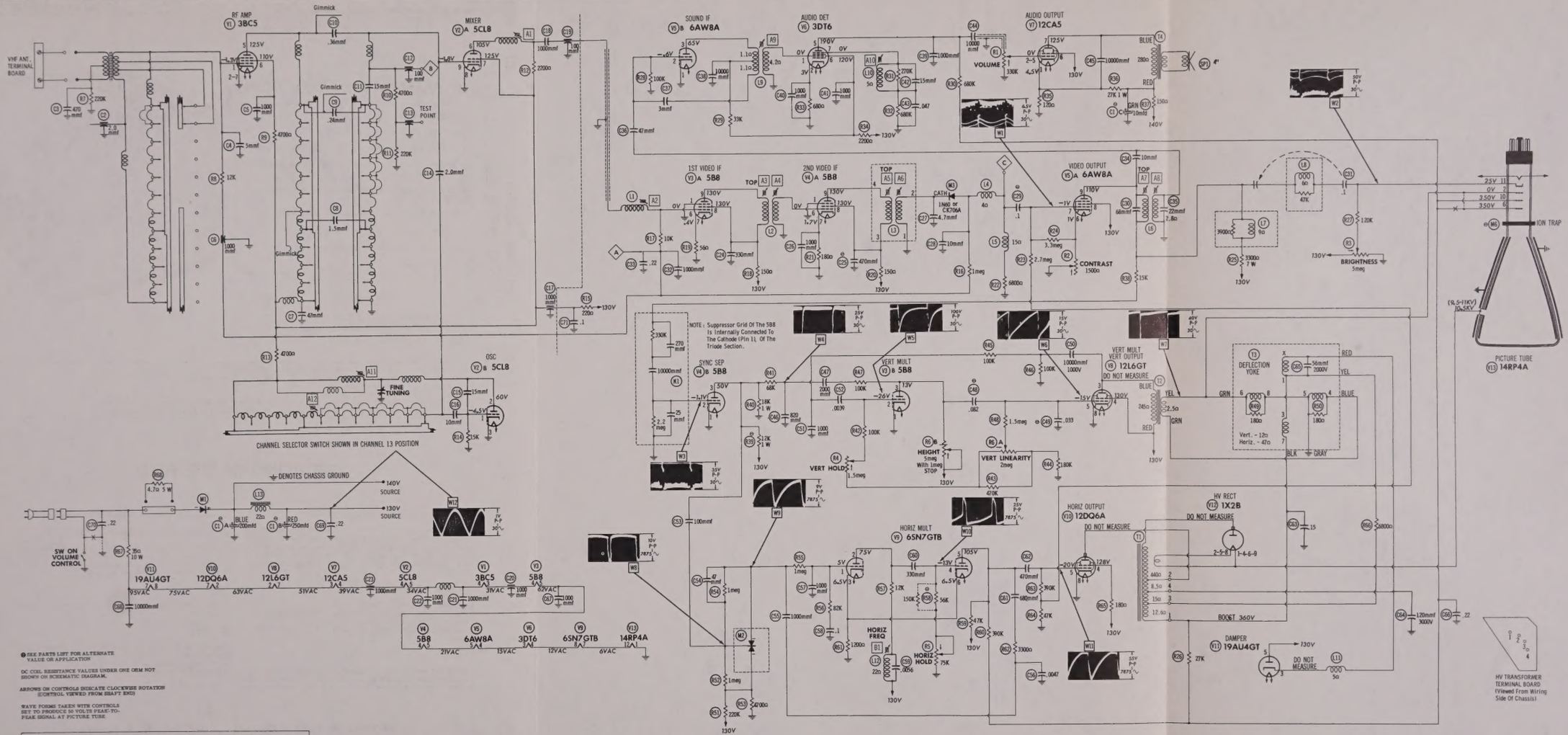
SET 400 FOLDER 1


RF AMP V1 3BC5
MIXER V2 A 5CL8
OSC V2 B 5CL8
SOUND IF V6 B 6AW8A
AUDIO DET V6 3DT6
AUDIO OUTPUT V7 12CA5
1ST VIDEO IF V3 A 5B8
2ND VIDEO IF V4 A 5B8
VIDEO OUTPUT V5 A 6AW8A
SYNC SEP V4 B 5B8
VERT MULT V5 B 5B8
VERT MULT VERT OUTPUT V9 12L6GT
HORIZ MULT V9 6SN7GTB
HORIZ OUTPUT V10 12DQ6A
HV RECT V12 1X2B
DAMPER V11 19AU4GT
PICTURE TUBE V13 14RP4A
ION TRAP
DEFLECTION YOKE
VOLUME
CONTRAST 1500Ω
BRIGHTNESS 5meg
HEIGHT 5meg With 1meg STOP
VERT HOLD 1.5meg
VERT LINEARITY 2meg
HORIZ FREQ
HORIZ HOLD 75K
FINE TUNING
TEST POINT
VHF ANT. TERMINAL BOARD
CHANNEL SELECTOR SWITCH SHOWN IN CHANNEL 13 POSITION
DENOTES CHASSIS GROUND
140V SOURCE
130V SOURCE
SW ON VOLUME CONTROL
NOTE : Suppressor Grid Of The 5B8 Is Internally Connected To The Cathode (Pin 1), Of The Triode Section.
BOOST 360V
DO NOT MEASURE
HV TRANSFORMER TERMINAL BOARD (Viewed From Wiring Side Of Chassis)
19AU4GT 12DQ6A 12L6GT 12CA5 5CL8 3BC5 5B8
95VAC 75VAC 63VAC 51VAC 39VAC 34VAC 31VAC 63VAC
5B8 6AW8A 3DT6 6SN7GTB 14RP4A
21VAC 13VAC 12VAC 6VAC

● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM.

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

WAVE FORMS TAKEN WITH CONTROLS SET TO PRODUCE 50 VOLTS PEAK-TO-PEAK SIGNAL AT PICTURE TUBE

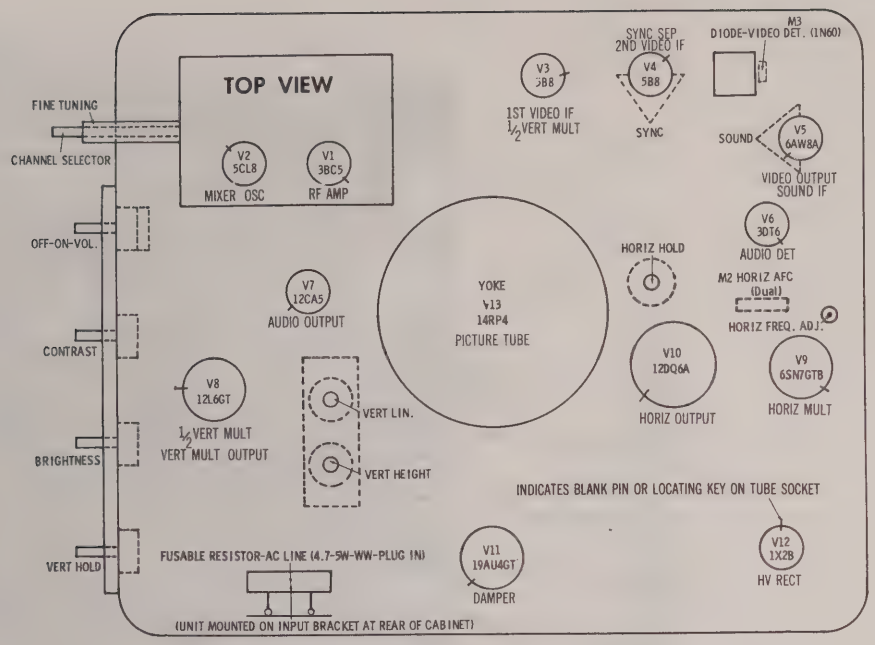
1. DC voltage measurements taken with vacuum tube voltmeter; AC voltage measured at 1,000 ohms per volt.
2. Pin numbers are counted in a clockwise direction (as looking at socket).
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. All controls set for normal operation; no signal applied.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1958

ARTONE MODELS
14TS78T, 14TS78TA

ARTONE MODELS
14TS78T, 14TS78TA

TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

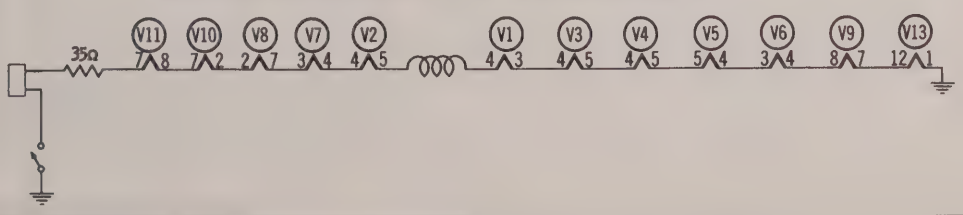
POWER SUPPLY FAILURE
No raster, no sound - Fusible Resistor (R68), Rectifier (M1)

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - V3, V4, Diode (M3), V5
No pic, no sound, has snow - V1, V2
No pic, has sound, has raster - V5, V13
Has pic, no sound - V5, V6, V7

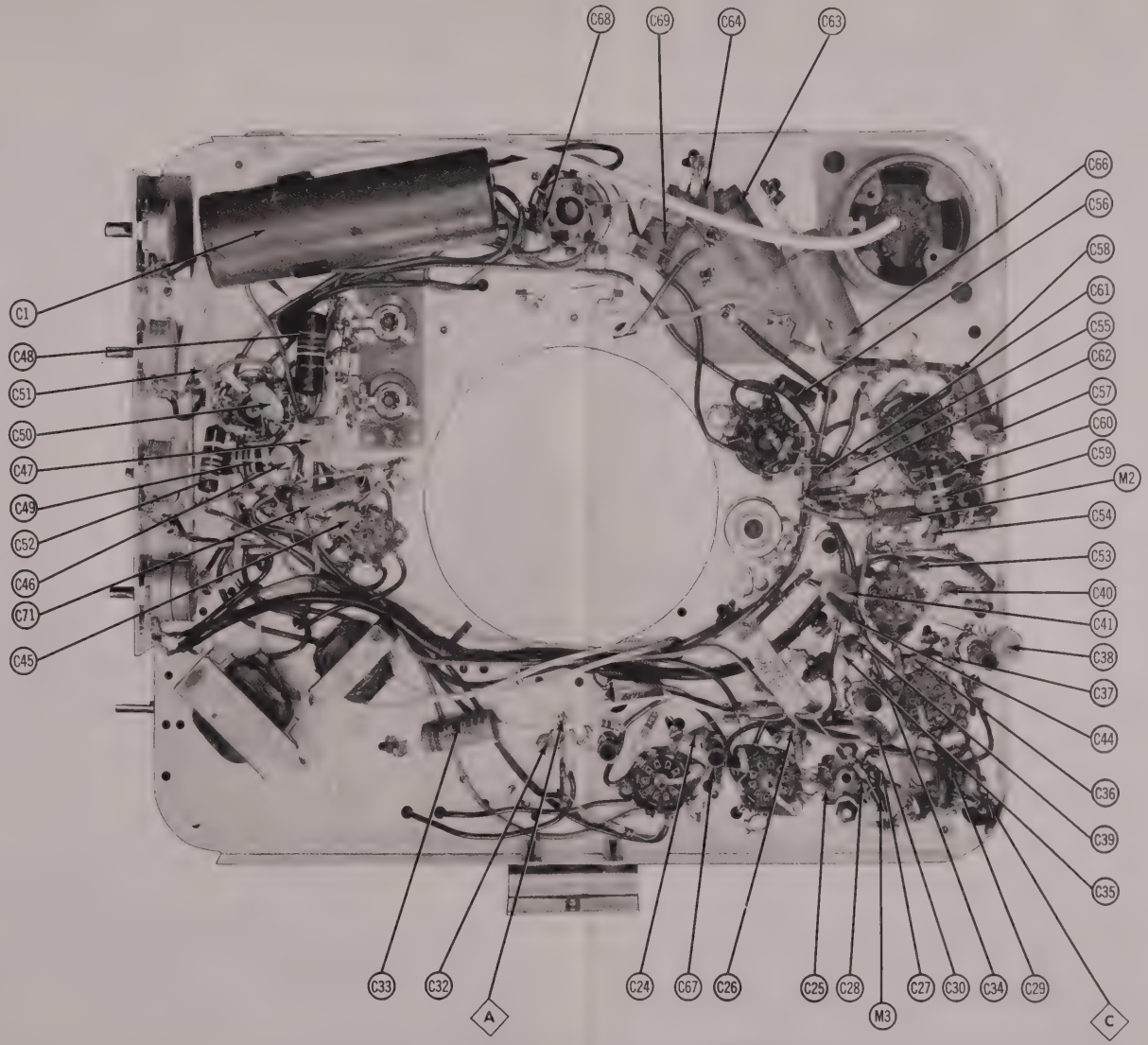
SYNC FAILURE
No vert. sync - V3, V4, V8
No horiz. sync - V4, Diode (M2), V9
No vert. or horiz. sync - V4

SWEEP FAILURE
No raster, has sound - M2, V9, V10, V11, V12, V13
No vertical deflection - V3, V8
Poor vert. linearity or foldover - V3, V8
Poor horiz. linearity or foldover - V9, V10, V11
Narrow picture - V9, V10, V11, M1
Vert. off freq. - V3, V4, V8
Horiz. off freq. - V4, M2, V9

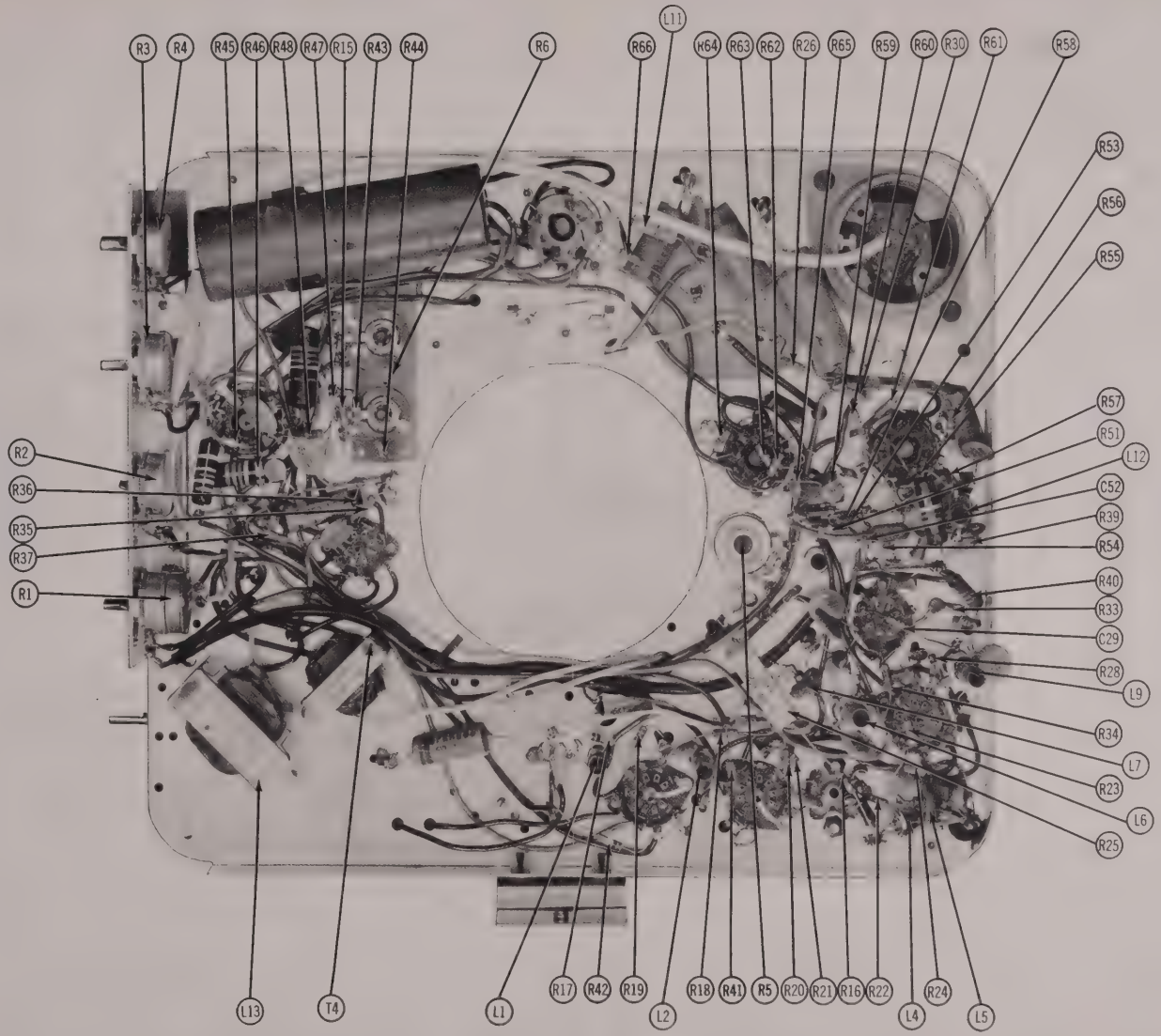
Since this receiver employs tubes used in a series filament network, an open filament in any tube in the series will cause the set to be inoperative. (See circuit below.)



SET 400 FOLDER 1



CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use an isolation transformer to protect the test equipment.
The high voltage lead should be securely taped and kept away from the chassis.

VIDEO IF ALIGNMENT

Connect the negative lead of a 3 volt bias battery to point (A). Positive to chassis.
Disable oscillator by replacing Mixer-Osc. tube 5CL8 (V2) with a 5CL8 with pin 1 removed.
Short the antenna terminals.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	1000MMF ceramic capacitor	High side to point (B). Low side to chassis.	44.0MC (10MC Swp)	42.75MC 45.75MC	Any channel.	Vert. amp. thru detector (Fig. 1) to plate, pin 9 of 5B8 (V3). Low side to chassis.	A1, A2	Adjust for response similar to Fig. 2 with markers in proper positions.
2.	"	High side to pin 6 (grid) of 5B8 (V3). Low side to chassis.	"	"	"	Vert. amp. thru detector (Fig. 1) to plate, pin 9 of 5B8 (V4). Low side to chassis.	A3, A4	"
3.	"	High side to pin 6 (grid) of 5B8 (V4). Low side to chassis.	"	"	"	Vert. amp. to point (C). Low side to chassis.	A5, A6	"
4.	"	High side to point B. Low side to chassis.	"	"	"	"		Retouch A1 thru A6 as needed to correct for curve similar to Fig. 3. Remove bias and replace 5CL8 (V2).

SOUND IF ALIGNMENT

Set the contrast control fully clockwise. Set volume control at midrange.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
5.	1000MMF ceramic capacitor	High side to point (C). Low side to chassis.	Not used.	4.5MC (400~ 30% AM Mod)	Any non-interfering channel.	Vert. amp. thru detector (Fig. 4) to pin 11 (cathode) of picture tube. Low side to chassis.	A7, A8	Turn A7 fully counter clockwise. Turn A8 fully clockwise. Turn A7 clockwise for MINIMUM 400~ indication on scope.
6.	"	"	4.5MC (15KC Swp)	Not used.	"	Across secondary of output transformer.	A8, A9, A10	Use only enough sweep generator output to provide usable pattern on scope. Turn A10 fully counter clockwise. Adjust A8, A9 and A10 for maximum indication on scope. Remove test equipment and tune in a TV station. Retouch A10 for MINIMUM buzz.

OSCILLATOR ALIGNMENT

Turn the set on and tune in the highest high band channel (7-13) operating in the area and adjust A11 for clearest picture and best sound. A11 is located below and to the right of the tuning shaft. Switch the channel selector to the highest low band channel (2-6) operating in the area and adjust A12 for clearest sound and best picture. A12 is located directly to the left of the tuner shaft.

RF AND MIXER ALIGNMENT

This portion of the receiver has been properly aligned at the factory and is very stable. Alignment of this portion should not be required in the field.

FIG. 1

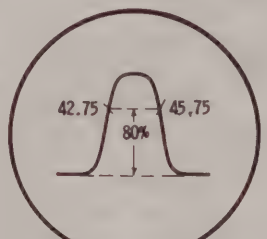


FIG. 2

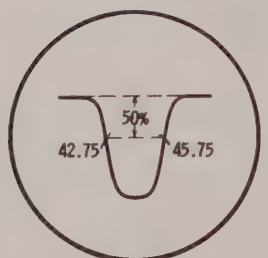


FIG. 3

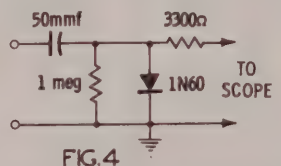
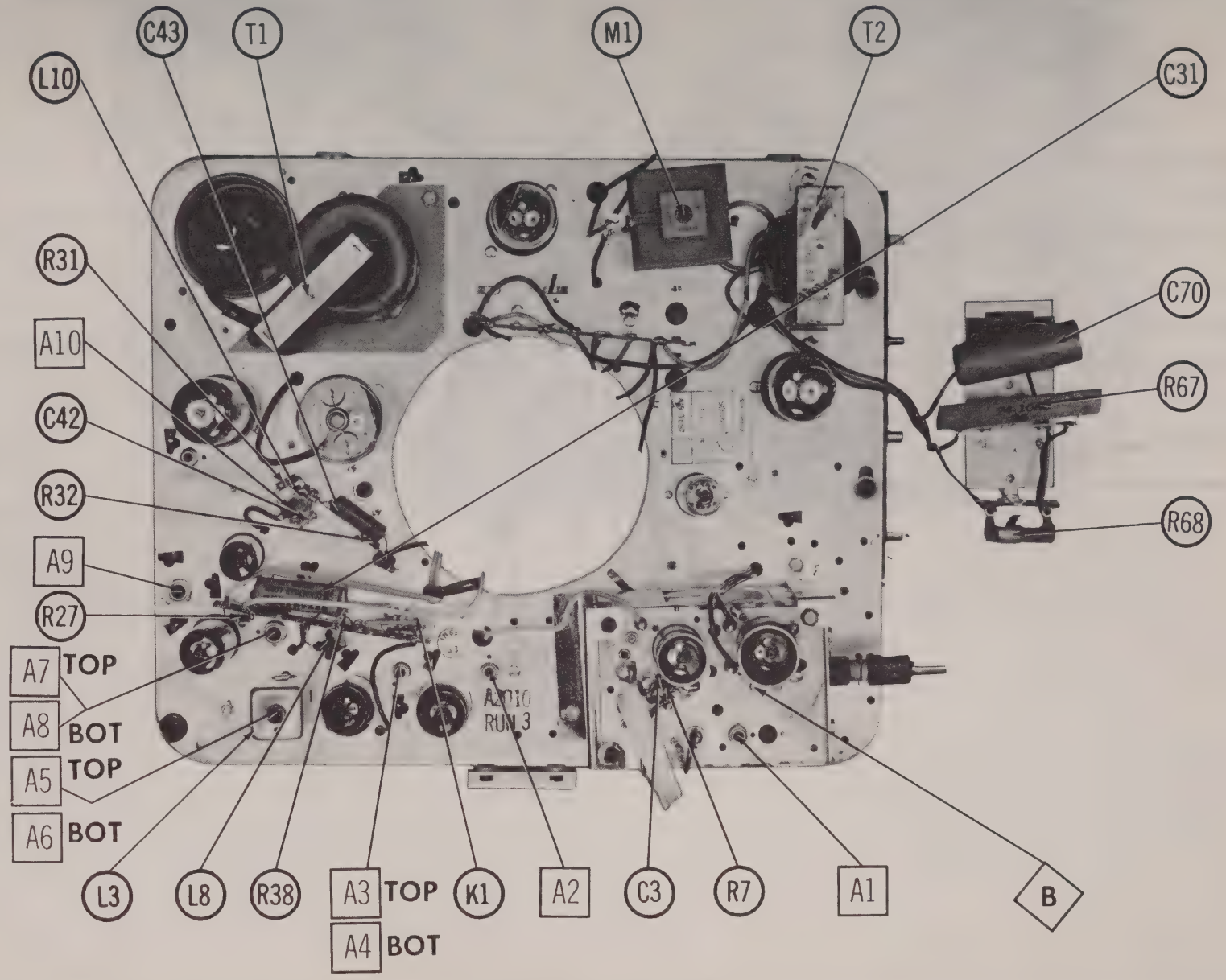


FIG. 4



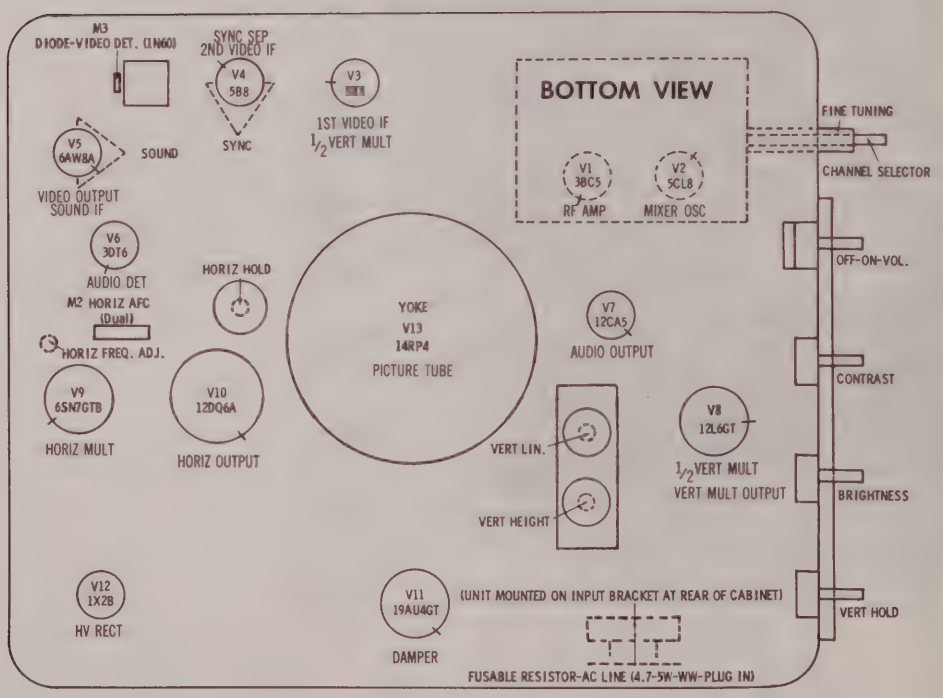
CHASSIS TOP VIEW

ARTONE MODELS
14TS78T, 14TS78TA

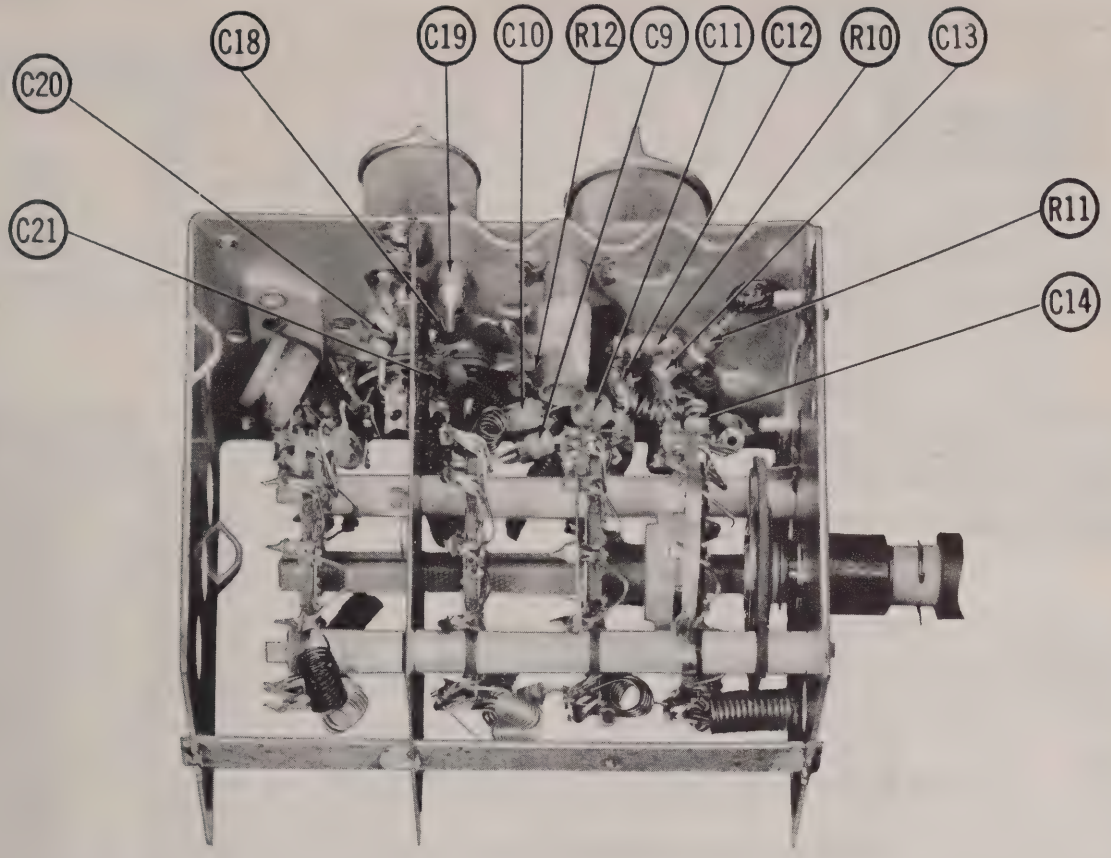
RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	3BC5	1Meg	0Ω	6.5Ω	7Ω	†240Ω	†5000Ω	0Ω		
V2	5CL8	15K	†5000Ω	0Ω	7.5Ω	7Ω	†2400Ω	†240Ω	0Ω	220K
V3	5B8	0Ω	•1.3Meg	•‡2.7Meg	6.5Ω	6.5Ω	1Meg	56Ω	†170Ω	†170Ω
V4	5B8	0Ω	2.2Meg	†12K	5.5Ω	5Ω	0Ω	180Ω	†170Ω	†170Ω
V5	6AW8A	0Ω	100K	†35K	3.5Ω	5Ω	• 10Ω	1.4Meg	†22Ω	†3300Ω
V6	3DT6	4.2Ω	680Ω	†3.5Ω	3Ω	‡700K	†2200Ω	680K		
V7	12CA5	120Ω	270K	9Ω	7.5Ω	270K	†22Ω	†430Ω		
V8	12L6GTB	TP	10.5Ω	†260Ω	†22Ω	•2.3Meg	TP	9Ω	0Ω	
V9	6SN7GTB	1.8Meg	†12K	1200Ω	•75K	†47K	1200Ω	1.5Ω	3Ω	
V10	12DQ6A	TP	10.5Ω	TP	†200Ω	440K	TP	11.5Ω	0Ω	TOP CAP ‡13Ω
V11	19AU4GT	NC	TP	480K	NC	†22Ω	TP	13Ω	11.5Ω	
V12	1X2B		PINS	1 THRU 9	HAVE	INFINITE	RESISTANCE			TOP CAP ‡453Ω
V13	14RP4	0Ω	3Ω	Pin 6 ‡27K	Pin 10 ‡27K	Pin 11 •†120K	Pin 12 1.5Ω			

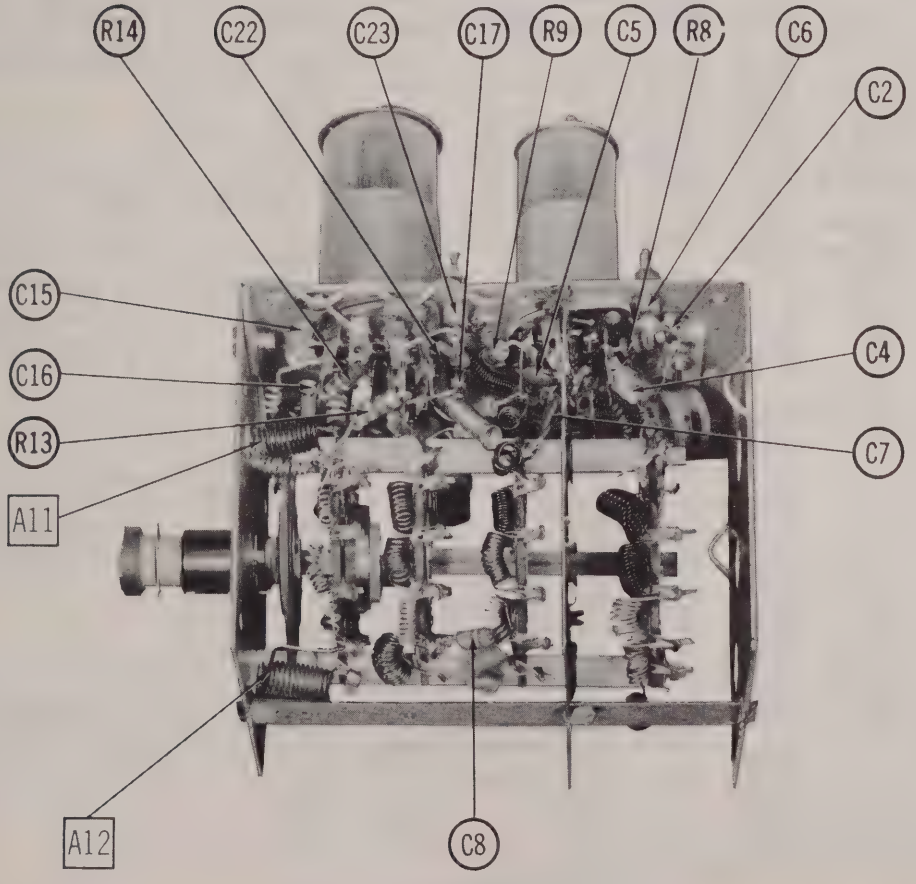
† MEASURED FROM OUTPUT OF M1.
‡ MEASURED FROM PIN 3 OF V11.
• THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
NC NO CONNECTION
TP TIE POINT



TUBE PLACEMENT CHART



RF TUNER-LEFT SIDE



RF TUNER-RIGHT SIDE

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No	USE	TYPE	NOTES
V1	RF Amp.	5BC5	
V2	Mixer-Osc.	5CL8	
V3	1st Video IF - Vert. Mult.	5B8	
V4	2nd Video IF - Sync Sup.	5B8	
V5	Video Output-Sound IF	8AW8A	
V6	Audio Det.	3DT6	
V7	Audio Output	12CA5	
V8	Vert. Mult. - Vert. Output	12L6GT	
V9	Horiz. Mult.	6SN7GTB	
V10	Horiz. Output	12DQ6A	
V11	Damper	19AU4GT	
V12	HV Rectifier	1X2B	

PICTURE TUBE

ITEM No	REPLACEMENT DATA				NOTES
	ARTONE PART No.		GENERAL ELECTRIC PART No	SYLVANIA PART No	
V13	14RP4A		14RP4A ①	14RP4A ②	① Aluminized ② Silver Screen "85"
			14RP4		

ELECTROLYTIC CAPACITORS

ITEM No	RATING		REPLACEMENT DATA						
	CAP	VOLT	ARTONE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No	PYRAMID PART No	SANGAMO PART No.	SPRAGUE PART No.
C1A	200	150	45A392 (Note 1)	PR3-012		WT320	CDBT-1015	D-095 MT-1510	R2294*
B	250	150							
C	10	150							

Note 1: Alternate part #45A394.
* Non catalog item.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	ARTONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	2.0									
C3	470		47A836	BPD-00047	DD-471	BYA10T47	ED-470	UC-5347	5GA-T47	
C4	5			NP0-S1 5	TCZ-4R7	C10V5C	TCO-5	ZT-5547	5TCCB-V5	
C5	1000		47-503	BPD-001	DD-102	BYA5D1	ED-1000	DC521	5HK-D1	
C6	1000			EF-001	MFT-1000				503C-D1	
C7	47		47CA20A470M	BPD-000047	DD-470	L10Q47	ED-47	UC-5447	5GA-Q47	
C8	1.5			NP0-S1 1.5	TCZ-1R5	C10V1SC	TCO-1.5	ZT-5515	5TCCB-V15	
C9	1.34									
C10	.36									
C11	18			BPD-000015	DD-150	L10Q15	ED-15	UC-5415	5GA-Q15	
C12										
C13	100									
C14	2.0			NP0-S1 2. 2	TCZ- 2. 2	C10V2C	TCO-2			
C15	18									N1000
C16	10			NP0-S1 10	TCZ-10	C10Q1C	TCO-10	ZT-541	5TCC-Q1	
C17	1000			EF-001	MFT-1000				503C-D1	
C18	1000		47-503	BPD-001	DD-102	BYA5D1	ED-1000	DC521	5HK-D1	
C19	100									
C20	1000			EF-001	MFT-1000				503C-D1	
C21	1000		47-503	BPD-001	DD-102	BYA5D1	ED-1000	DC521	5HK-D1	
C22	1000		47-503	BPD-001	DD-103	BYA6D1	ED-1000	DC521	5HK-D1	
C23	1000			EF-001	MFT-1000				503C-D1	
C24	330		47A661	BPD-00033	DD-331	C10T33	ED-330	UC-5333	5GA-T33	
C25	470		47A643	BPD-00047	DD-471	BYA10T47	ED-470	UC-5347	5GA-T47	Note 2
C26	1000		47A230	BPD-001	DD-102	BYA5D1	ED-1000	DC521	5HK-D1	
C27	4.7		47B403-6	NP0-S1 4. 7	TCZ-4R7	C10V47C	TCO-4. 7	ZT-555	5TCCB-V47	
C28	10		47CA20A100K	S1 10	D6-100	LT6Q1	GP-10	UC-541	5GA-Q1	
C29	.1	150		P288N-1	DF-104	CUB2P1		GEM-3D1	2TM-P1	Note 3
C30	68		47-S35							N75
C31	.1	200	46D616-104M2	P288N-1	DF-104	CUB2P1		GEM-201	2TM-P1	
C32	1000		47A230	BPD-001	DD-102	BYA5D1	ED-1000	DC521	5HK-D1	
C33	.22	100	46D616-224M1	P288N-22		CUB2P23		GEM-2022	2TM-P22	
C34	10		47A160-11	S1 10	D6-100	LT6Q1	GP-10	UC-541	5GA-Q1	
C35	22		47-434							N75
C36	47		47CA20A470M	S1 47	D6-470	LT6Q47	GP-47	UC-5447	5GA-Q47	
C37	3		47A807	S1 3	D6-030	LT6Y3	TCO-3	ZT-553		
C38	10000		47A234	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C39	1000		47A230	BPD-001	DD-103	BYA5D1	ED-1000	DC521	5HK-D1	
C40	1000		47A230	BPD-001	DD-102	BYA5D1	ED-1000	DC521	5HK-D1	
C41	1000		47A230	BPD-001	DD-102	BYA5D1	ED-1000	DC521	5HK-D1	
C42	15		47B480							ND80
C43	.047	200	46D618-473M2	BPD-05	DF-503	CUB2S47		GEM-2147	2TM-S47	
C44	10000		47A234	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C45	10000		47A234	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C46	820		47-606	BPD-0008	D6-821	L10T82	ED-820		5GA-T82	
C47	2000		47A395	BPD-002	DD-202	BYA10D2	ED-002	DC522	5HK-D2	
C48	.082	200		P288N-S33	DF-303	CUB2S33		GEM-4133	5TM-S33	Note 4
C49	.033	200								Note 4
C50	10000	1000	47-505	P10S8N-01	DD-103	BYA10S1M			10HK8-S1	
C51	500		47-503	BPD-001	DD-103	BYA5D1	ED-001	DC521	5HK-D1	
C52	.0039	200	46BR392E4	BPD-004	D6-402	CUB2D39	GP-4000	GEM-624	5TM-D4	
C53	100		47CA20A101M	S1 100	D6-101	LT6T1	GP-100	UC-531	5GA-T1	
C54	47		47CA20A470M	S1 47	D6-470	LT6Q47	GP-47	UC-5447	5GA-Q47	
C55	1000		47A586	BPD-001	DD-102	BYA5D1	ED-1000	DC521	5HK-D1	
C56	.0047	200	46D618-472K2	BPD-0047	D6-472	CUB2D47	GP-4700	GEM-6247	5TM-D47	
C57	1000		47A586	BPD-001	DD-102	BYA5D1	ED-1000	DC521	5HK-D1	
C58	.1	200	46D618-104M2	P288N-1	DF-104	CUB2P1		GEM-201	2TM-P1	
C59	.0056	400	46BR562E4	P488N-005	D6-562	CUB6D5	GP-5600	GEM-425	6TM-D5	
C60	330		47X20D33K	1464-00033		5WS733			MS-333	
C61	680		47X20B68K	1464-00068		1WS768			MS-347	
C62	470		47A638	BPD-00047	DD-471	BYA10T47	ED-470	UC-5347	5GA-T47	
C63	.15	600	46D618-154M6	P488N-15	--	CUB6P15		GEM-6015	6TM-P15	
C64	120	3000	47-640		DD30-121	HVB30T12			30GA-T12	
C65	56	2000	47A637		DD30-56	HVA20Q56	HD3-56	DC30456	20GA-Q56	
C66	.22	600		P488N-22		CUB6P23		GEM-6022	6TM-P22	
C67	1000		47A230	BPD-001	DD-102	BYA5D1	ED-1000	DC521	5HK-D1	
C68	10000		47A234	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C69	.22	200	46D618-224M6	P288N-22		CUB2P23		GEM-2022	2TM-P22	
C70	.22	600	46D618-224M6	P488N-22		CUB6P23		GEM-6022	6TM-P22	
C71	.1	200	46D618-104M2	P288N-1	DF-104	CUB2P1		GEM-201	2TM-P1	

Note 2: Some versions may use 390MMF (Part #47A659) in this application.
Note 3: Some versions may use .047@ 200V (part #46D618-473M2) in this application.
Note 4: Some versions may use a 10% .047 @ 200V (part #46D618-473K2) in this application.

CONTROLS

ITEM No	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	ARTONE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	330K	½	25B400	B-80	A47-500K-2	Q13-132	TA334A	Volume
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
C	Switch			KB-1	SWE-12	T6-1	UB-26	
R2A	1500Ω	½	25B1399	B-515		Q17-109	U5	Contrast
B	Shaft			Not Req.		Not Req.	Not Req.	
R3A	5Meg	½	25B1401			Q17-141	TA58K	Brightness
B	Shaft					Not Req.	Not Req.	
R4A	1. 5Meg	½	25B1402	B-742	A47-1.5Meg-S	Q11-138	U155	Vert. Hold
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R5A	75K	½	25-1305	B-35	A47-75K-S	Q11-125	PTA15L	Horiz. Hold
B	Shaft			Not Req.	FKS-1/2	Not Req.	Not Req.	
R6A	2Meg	½	25B1386					Vert. Linearity Height With 1Meg Stop
B	5Meg							

RESISTORS

All wattages 1/2 watt, or less unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA	NOTES
	OHMS	WATT	ARTONE PART No.	
R7	220K		23X20X224K	
R8	12K		23X20X123K	
R9	4700Ω		23X20X472K	
R10	4700Ω		23X20X472K	
R11	220K		23X20X224K	
R12	2200Ω		23X20X222K	
R13	4700Ω		23X20X472K	
R14	15K		23X20X153K	
R15	220Ω		23X20X221K	
R16	1Meg		23X20X105K	
R17	10K		23X20X103K	
R18	150Ω		23X20X151K	
R19	56Ω		23X20X560K	
R20	150Ω		23X20X151K	
R21	180Ω		23X20X181K	
R22	6800Ω		23X20X682K	
R23	2. 7Meg		23X20X275K	
R24	3. 3Meg		23X20X335K	
R25	3300Ω	7	24A1123	
R26	27K		23X20X273K	
R27	120K		23X20X224K	
R28	100K		23X20X104K	
R29	33K		23X20X333K	
R30	680K		23X20X684K	
R31	270K		23X20X274K	
R32	680K		23X20X684K	
R33	680Ω		23X20X68LK	
R34	2200Ω		23X20X222K	
R35	120Ω		23X20X121K	
R36	27K	1	23X30X273K	
R37	150Ω		23X20X151K	

ITEM No.	RATING		REPLACEMENT DATA	NOTES
	OHMS	WATT	ARTONE PART No.	
R38	15K		23X20X153K	
R39	12K	1	23X30X123K	Note 1
R40	18K	1	23X30X183K	
R41	68K		23X20X683K	
R42	100K		23X20X104K	
R43	470K		23X20X474K	
R44	180K		23X20X184K	
R45	100K		23X20X104K	
R46	100K		23X20X104K	
R47	100K		23X20X104K	
R48	1. 5Meg		23X20X155K	
R49	180Ω		23X20X181K	
R50	180Ω		23X20X181K	
R51	230K		23X20X234K	
R52	1Meg		23X20X105K	
R53	4700Ω		23X20X472K	
R54	1Meg		23X20X105K	
R55	1Meg		23X20X105K	
R56	82K		23X20X823K	
R57	12K		23X20X123K	
R58	56K		23X20X563K	Note 2
R59	47K		23X20X473K	
R60	390K		23X20X394K	
R61	1200Ω 5%		23X20X122J	
R62	3300Ω		23X20X332K	
R63	390K		23X20X394K	
R64	47K		23X20X473K	
R65	180Ω		23X20X181K	
R66	6800Ω		23X20X682K	
R67	35Ω	10	24-1086	
R68	4. 7Ω	5	24B1116	

Note 1: "A" version uses a 22K, 1 W resistor (part #23X30X223K) in this application.
Note 2: Some versions may use an 82K (part #23X20X823K), an 82K paralleled by 150K, or a 68K (part #23X20X683K) in this application.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No	USE	REPLACEMENT DATA							
		ARTONE PART No	Halldorson PART No	Merit PART No		Ram PART No	Stancor PART No	Thordarson PART No	Triad PART No
T1	Horiz. Output Trans.	55-304							
T2	Vert. Output Trans.	55-309	21900 ①					26S75 ②	
T3	Yoke(90° Horiz(24.5MH Vert(1.5MH)	53-398							

① Connect #1 to plate; #2 to B+ ; #7 to yoke terminal #4; #10 to yoke terminal #6.
② Connect #1 to plate; #2 to B+ ; #7 to yoke terminal #6; #10 to yoke terminal #4.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	ARTONE PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T4	4300Ω	3-4Ω	55C306	Z1107 ①	A-3026	A-3877 ①	24S61 ①	S-6X	① Drill one new mtg. hole.

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	ARTONE PART No.	QUAM PART No.	
SP1	4"	PM	3-4Ω	85C175A	4A07	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA				NOTES
		ARTONE PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	1st Video IF	51-2167				
L2	2nd Video IF	51-2168				
L3	3rd Video IF	50-558				
L4	RF Choke	53A327	19-1006		4634	18 Microhenries
L5	Shunt Peaking Coil	51-2102	19-3060		6148	710 Microhenries
L6A	4. 5MC Trap	51B1996				
B	1st Sound IF					
L7	Shunt Peaking Coil	51-2101	19-4400▲		6134▲	396 Microhenries; Wound on 3900Ω resistor.
L8	Series Peaking Coil	51-2100	19-3180*	TV-184*	6180*	185 Microhenries; Wound on 47K resistor.
L9	2nd Sound IF	51-2166				
L10	Quadrature Coil	51B1557			1480	
L11	RF Choke	53-343				7. 5 Microhenries; IRC part #CLA

* Parallel with 47K resistor.
▲ Parallel with 3900Ω resistor.

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES		REPLACEMENT DATA							NOTES
	PRI	SEC	ARTONE PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.		Ram PART No.	Thordarson PART No.	
L12			51-2189	19-1575		6210 ①			HS-4	

① Enlarge mounting hole. A 3900MMF capacitor may have to be used in place of .0056 (C59).

FILTER CHOKE

ITEM No	RATINGS			REPLACEMENT DATA						
	TOTAL DIRECT CURRENT	D. C RESISTANCE	INDUCTANCE @ CURRENT 1000 (%)	ARTONE PART No.	Halldorson PART No	Merit PART No	Stancor PART No	Thordarson PART No	Triad PART No	
L13	.280A	22Ω	.5HY	56A253	C5041 ①	C-2996 ①	C-2328 ①	25C44 ①	C-23X ①	

① Drill one new mtg. hole.

COMPONENT COMBINATIONS

ITEM No	USE	DESCRIPTION	ARTONE PART No.	REPLACEMENT DATA	
K1	Sync Couplate	270MMF, 25MMF, 10000MMF, 330K, 2. 2Meg	49A048	Aerovox Cenlralab Sprague	PA-533 PC-361 ST-3

RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA						
	CURRENT (Measured)	ARTONE PART No.	FEDERAL PART No.	GENERAL ELECTRIC PART No.	INTERNATIONAL PART No.		RADIO RECEPTOR PART No.	SARKES TARZIAN PART No.
M1	.280A	27C238 ①	1023A ①	1N1007 ③	RS350SL ①		6QA3 ①	350A ①
M2		27C226 ①	1215 ① ③		1T1 ① ③			

① Selenium type.
② Germanium type.
③ 2 required.

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA		NOTES
		ARTONE PART No.	SYLVANIA PART No.	
M3	1N60*	19C1864	1N60	Video Detector (Pigtail)

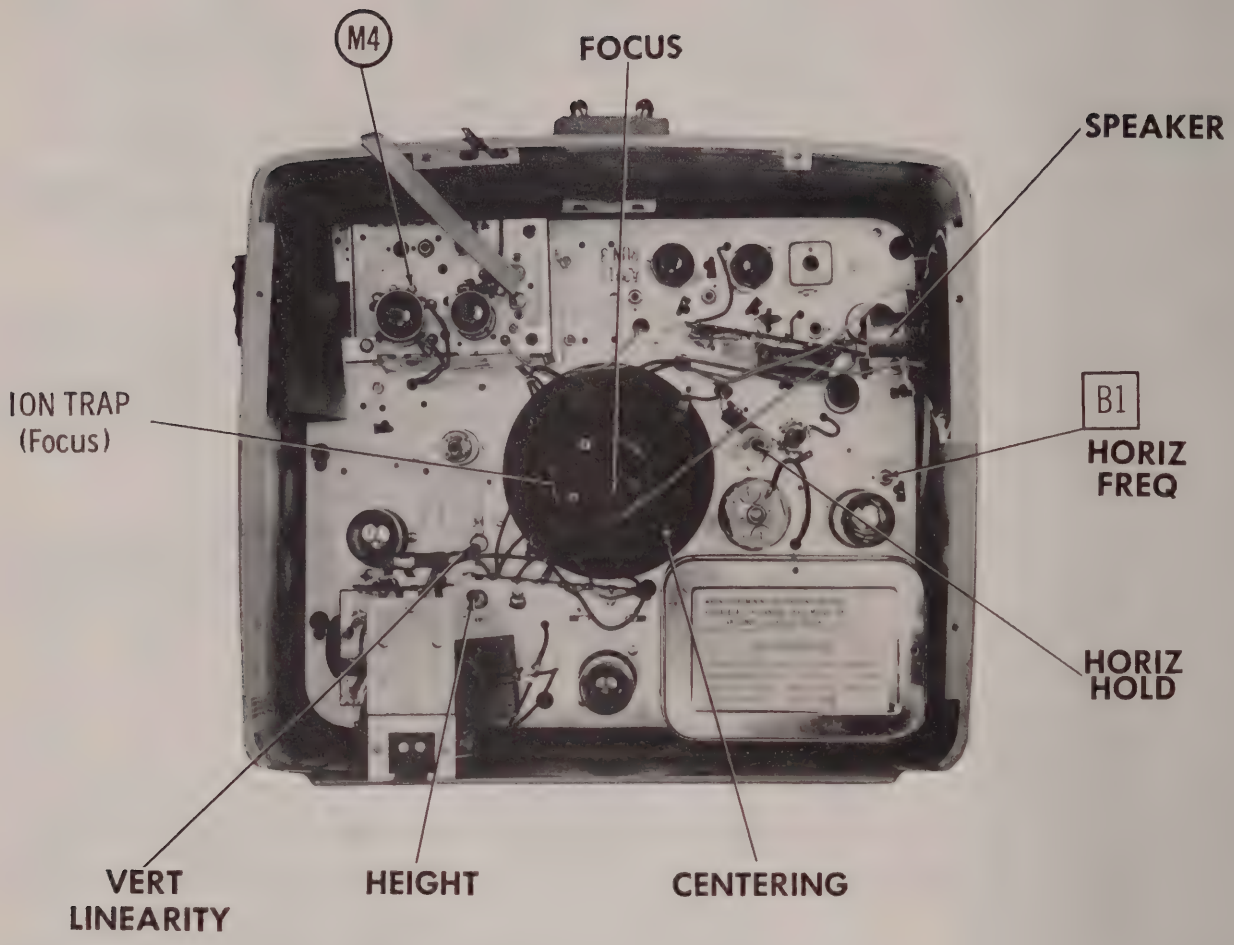
* A CK-706A may be used in this application.

MISCELLANEOUS

ITEM No.	PART NAME	ARTONE PART No.	NOTES
M4	Tuner	1-3087	VHF
M5	Centering Device	21B216	
M6	Ion Trap	21B188	
	Safety Glass	32D534	
	Knob	15B1055	Control, 4 Used
	Knob	15C1038	Fine Tuning.
	Knob	15A1040	Channel Selector

ARTONE MODELS 14T578T, 14T578TA

FOLDER 1



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

HORIZONTAL OSCILLATOR ADJUSTMENTS

1. Turn the set on and tune in a TV station, preferably with a test pattern.
2. Set the horizontal hold control to its mid-range position and adjust the horizontal frequency slug (B1) until the picture synchronizes horizontally.
3. Check other stations and if necessary, retouch B1 for best sync action on all channels.

EMERSON MODELS 1404, 1405, 1418, 1419, 1420, 1421, 1424, 1425, 1426, 1428 (Ch. 120369C, 120370G, 120377C, 12400S, 120401U, 120403S, 120404U)

MODEL 1420 (Ch. 120377C)

TRADE NAME	Emerson	MODELS	CHASSIS
		1426, 1428	120369C
		1421, 1425	120370G
		1420, 1424	120377C
		1404	120400S
		1405	120401U
		1418	120403S
		1419	120404U
		Radio	120397B
MANUFACTURER	Emerson Radio & Phonograph Corp., 14th. & Coles Sts., Jersey City 2, N.J.		
TYPE SET	Television Receiver		
TUBES	Eighteen		
POWER SUPPLY	110-120 Volts, 60 Cycle	RATING 185 Watts, 1.75 Amp. @ 117 Volts AC	
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)		

MODELS 1418 AND 1419 USE EMERSON RECORD CHANGER #819113 SIMILAR TO UNIT COVERED IN PHOTOFACT SET 353 - FOLDER 16.

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustment of the VHF oscillator is possible by removing the channel selector and fine tuning knobs. Set the fine tuning at the center of its range. One slug for HIGH band adjustment is located at 6 o'clock and should be adjusted first. Three LOW band adjustments are located in a partial circle around the tuner shaft. Channels 6 and 5 are the first adjustment clockwise from the high band adjustment, channels 4 and 3 the second and channel 2 the third. Adjust for best picture and sound in channel sequence beginning with the highest channel in the area and adjusting in descending order.

PICTURE TUBE SAFETY GLASS CLEANING

Models 1420, 1421, 1424, 1425, 1426, 1428.
Remove the channel selector and fine tuning knobs. Remove the trim strip at the right edge of the safety glass by pulling off. Remove 2 metal screws holding the safety glass clamps. Remove the safety glass.
Models 1404, 1405, 1418, 1419.
See steps 1, 2 and 3 of "Chassis Removal" for these models.

SPECIAL ADJUSTMENTS

A. Local-Distance
Observe the picture and advance the Local-Distance control to a point where the picture distorts or a buzz is heard in the sound. Back off from this setting until the picture becomes stable with no noise in the sound.

B. Focus
No provision is made to vary the focus on this receiver.

C. Width
The width may be varied by means of a metallic sleeve located between the yoke and the picture tube neck. Adjust sleeve in or out of the yoke for a picture SLIGHTLY larger than necessary to fill the screen.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENTS

Set Horizontal Hold to center of its range. Adjust Horizontal Balance control until picture synchronizes horizontally.

FUSES

One fuse is used for LV power supply protection. (For location, see tube placement chart).

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube. Rotate the two rings around the neck of the tube until the picture is properly centered.

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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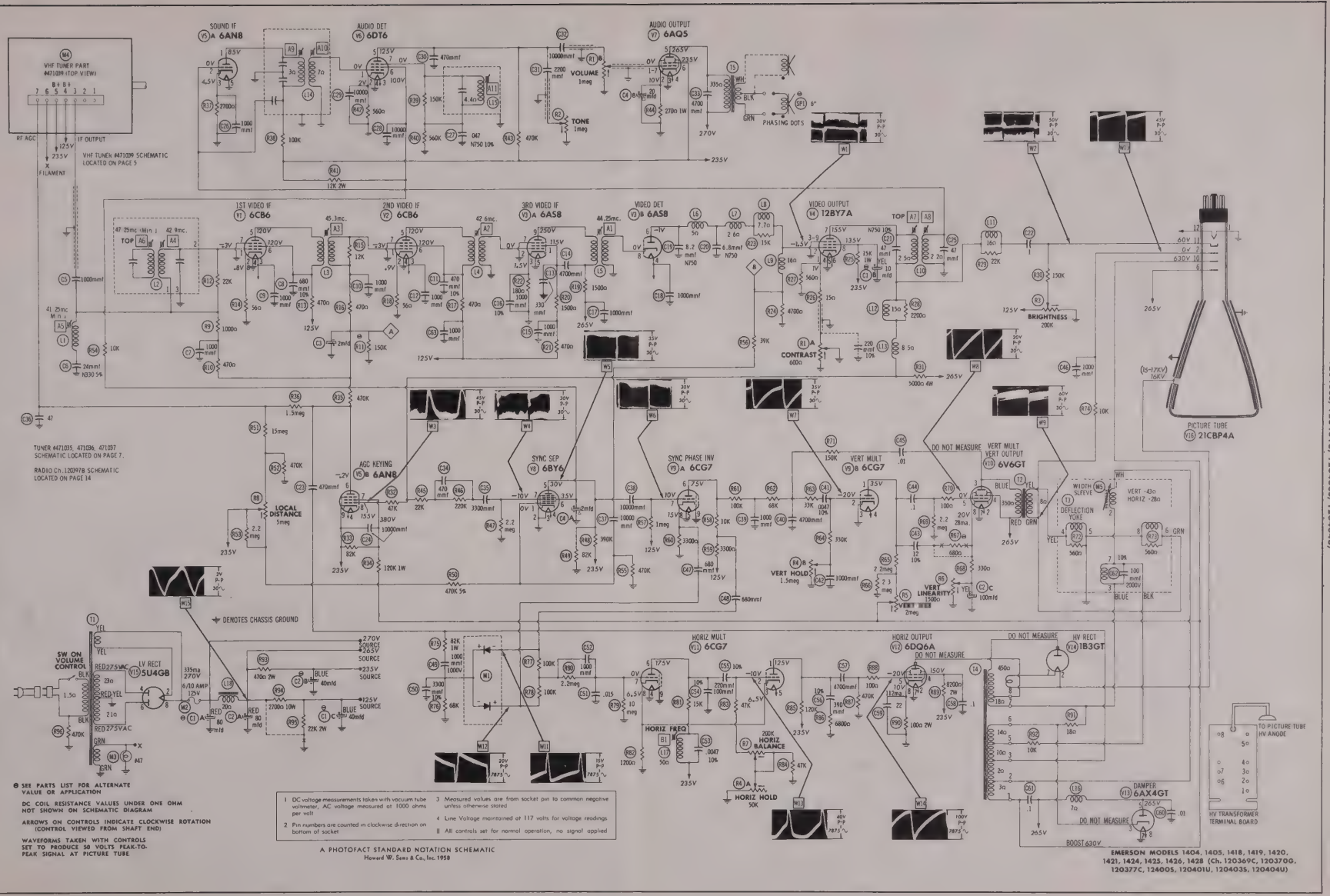
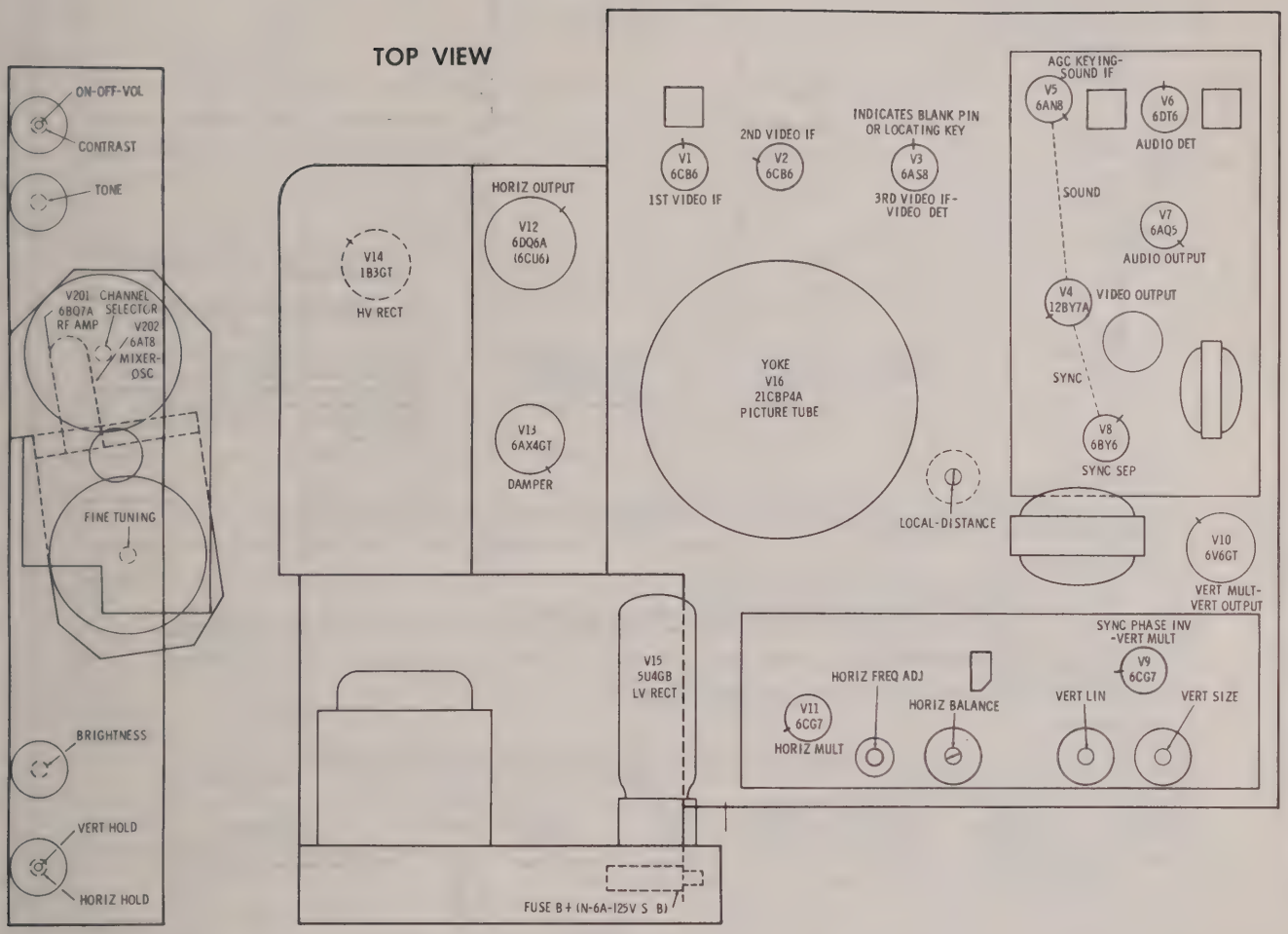
H491

EMERSON MODELS 1404, 1405, 1418, 1419, 1420, 1421, 1424, 1425, 1426, 1428 (Ch. 120369C, 120370G, 120377C, 12400S, 120401U, 120403S, 120404U)

SET 400 FOLDER 2


SOUND IF
V5 A 6AN8
AUDIO DET
V6 6DT6
AUDIO OUTPUT
V7 6AQ5
VOLUME
1meg
TONE
1meg
PHASING DOTS
VHF TUNER PART
#471039 (TOP VIEW)
RF AGC
IF OUTPUT
125V
235V
FILAMENT
VHF TUNER #471039 SCHEMATIC LOCATED ON PAGE 5
1ST VIDEO IF
V1 6CB6
2ND VIDEO IF
V2 6CB6
3RD VIDEO IF
V3 A 6AS8
VIDEO DET
V3 B 6AS8
VIDEO OUTPUT
V4 12BY7A
CONTRAST
600a
BRIGHTNESS
200K
PICTURE TUBE
V16 21CBP4A
TUNER #471035, 471036, 471037
SCHEMATIC LOCATED ON PAGE 7.
RADIO CH.120397B SCHEMATIC
LOCATED ON PAGE 14
AGC KEYING
V5 B 6AN8
LOCAL
DISTANCE
5meg
SYNC SEP
V8 6BY6
SYNC PHASE INV
V9 A 6CG7
VERT MULT
V9 B 6CG7
VERT HOLD
1.5meg
VERT
LINEARITY
1500a
VERT MULT
VERT OUTPUT
V10 6V6GT
DEFLECTION
YOKE
WIDTH
SLEEVE
VERT -43a
HORIZ -28a
DO NOT MEASURE
DENOTES CHASSIS GROUND
SW ON
VOLUME
CONTROL
LV RECT
V15 5U4GB
HORIZ MULT
V11 6CG7
HORIZ FREQ
HORIZ
BALANCE
HORIZ HOLD
50K
HORIZ OUTPUT
V12 6DQ6A
HV RECT
V14 1B3GT
DAMPER
V13 6AX4GT
BOOST 630V
TO PICTURE TUBE
HV ANODE
HV TRANSFORMER
TERMINAL BOARD
SEE PARTS LIST FOR ALTERNATE
VALUE OR APPLICATION
DC COIL RESISTANCE VALUES UNDER ONE OHM
NOT SHOWN ON SCHEMATIC DIAGRAM
ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION
(CONTROL VIEWED FROM SHAFT END)
WAVEFORMS TAKEN WITH CONTROLS
SET TO PRODUCE 50 VOLTS PEAK-TO-
PEAK SIGNAL AT PICTURE TUBE.
1 DC voltage measurements taken with vacuum tube voltmeter, AC voltage measured at 1000 ohms per volt
2 Pin numbers are counted in clockwise direction on bottom of socket
3 Measured values are from socket pin to common negative unless otherwise stated.
4 Line Voltage maintained at 117 volts for voltage readings
II All controls set for normal operation, no signal applied
A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1958
EMERSON MODELS 1404, 1405, 1418, 1419, 1420, 1421, 1424, 1423, 1426, 1428 (Ch. 120369C, 120370C, 120377C, 124005, 120401U, 120403S, 120404U)

TUBE PLACEMENT CHART



EMERSON MODELS 1404, 1405, 1418, 1419, 1420, 1421, 1424, 1425, 1426, 1428 (Ch. 120369C, 120370G, 120377C, 124005, 120401U, 120403U, 120404U)

TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound Fuse (M2), V15

SWEEP FAILURE
No raster, has sound M1, V11, V12, V13, V14, V16
No vertical deflection V9, V10
Poor vert. linearity or foldover V9, V10
Poor horiz. linearity or foldover V11, V12, V13
Narrow picture V11, V12, V13, V15
Vert. off freq. V9, V10
Horiz. off freq. V11

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster V1, V2, V3, V4
No pic, no sound, has snow V201, V202, V1
No pic, has sound, has raster V4, V16
Has pic, no sound V5, V6, V7
Overloaded picture V5

SYNC FAILURE
No vert. sync V8, V9
No horiz. sync V8, V9, Rectifier (M1)
No vert. or horiz. sync V8, V9

FOLDER 2

ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

The high voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.

VIDEO IF ALIGNMENT

Connect the negative lead of a 3 volt bias supply to point Ⓐ . Positive to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
Use only enough generator output to provide a usable indication on VTVM.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Direct	Place a thin insulated metal strip between the mixer-osc. tube (V202), and tube shield. Connect the high side of sweep generator to the metal strip. Low side to chassis.	Not used	44.25MC	Any non-interfering channel	USE VTVM. DC probe to point Ⓑ . Low side to chassis. (Across video det. load)	A1	Adjust for maximum deflection.
2.	"	"	"	42.6MC	"	"	A2	"
3.	"	"	"	45.3MC	"	"	A3	"
4.	"	"	"	42.9MC	"	"	A4	"
5.	"	"	"	45.3MC	"	"	Mixer Plate Coil	"
6.	"	"	"	41.25MC	"	"	A5	Increase generator output and adjust for MINIMUM deflection.
7.	"	"	"	47.25MC	"	"	A6	Increase generator output and adjust for MINIMUM deflection. Repeat steps 4 and 5.
8.	"	"	44MC (10MC Swp)	41.25MC 42.9MC 45.75MC 47.25MC	"	Vert. Amp. to point Ⓑ . Low side to chassis. (Across video det. load).		Use only enough sweep generator output to provide a usable pattern on scope. Check for response similar to Fig. 1. If necessary, retouch A1 to place 45.75MC marker in correct position. 42.9MC must not fall below 80%.

4.5MC TRAP ALIGNMENT

Tune in a strong station and adjust the fine tuning to the point where the 4.5MC beat interference just begins to appear in the picture. Adjust A7 for MINIMUM beat pattern in the picture.

SOUND IF ALIGNMENT

Tune in a strong station and adjust A8, A9 and A10 for loudest sound.
Adjust A11 for clearest and loudest sound. If two peaks occur, peak with slug nearest chassis.
Disconnect antenna and loosely couple to obtain weak signal and repeat adjustment of A8, A9 and A10 tuning for maximum sound with MINIMUM distortion.
Check the voltage drop across R40 (560K resistor). It should measure between -4 and -9 volts and should not vary more than two volts between a strong signal and a weak one.
Check sound on all available channels and repeat entire procedure, if necessary.

RADIO ALIGNMENT

Use isolation transformer, if available. If not, connect a .1mfd capacitor in series with low side of signal generator and B-.
Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
9.	.005mfd	High side to antenna stator lug on tuning gang. Low side to chassis.	455KC (400% Mod)	Radio	Tuning gang fully open.	Across voice coil	A12, A13, A14, A15	Adjust for maximum output.
10.		Loop	1620KC	"	"	"	A16	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
11.		"	1400KC	"	Tune to 1400KC signal.	"	A17	"

TUNER ALIGNMENT INSTRUCTIONS LOCATED ON PAGE 6.

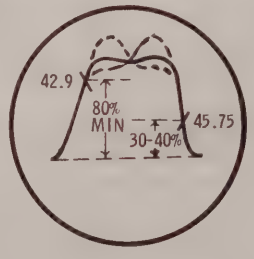


FIG. 1

TUNER #47039
EMERSON MODELS 1404, 1405, 1418, 1419, 1420, 1421, 1424, 1425, 1426, 1428 (Ch. 120369C, 120370G, 120377C, 120400S, 120401U, 120403S, 120404U)
FOLDER 2
RF AMP 6BQ7A
MIXER A 6AT8
OSC B 6AT8
45.3mc. MIXER PLATE COIL
IF OUTPUT
RF AGC
FILAMENT
FINE TUNING
COUPLING STRAP
CHANNEL SELECTOR SWITCH SHOWN IN CHANNEL 13 POSITION
VHF ANT. TERMINAL BOARD
◆ MEASURED FROM PIN 3 OF V201.
⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1958

TUNER PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V201	RF Amp.	6BQ7A	

ITEM No.	USE	TYPE	NOTES
V202	Mixer-Osc.	6AT8	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	EMERSON PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C201	5			NPO-DI 5		C10V5C	TCO-5	ZT-555		NPO 10% ①
C202	47			N750-DI 47	DTN-47	C10Q47U	TC7-47	NT-5447	5TCU-Q47	N750
C203	5			NPO-DI 5		C10V5C	TCO-5	ZT-555		NPO 10%①
C204	10			NPO-DI 10	DTZ-10	C10Q1C	TCO-10	ZT-541	5TCC-Q1	NPO 10%
C205	2.7									NPO 10%
C206	1.5									NPO ±.25mmf
C207	2.7									NPO 10% ②
C208	1000			EF-001	MFT-1000				503C-D1	
C209	1.5						TCO-1.5			NPO ±.25mmf
C210	800				DD-801	L10T8			5GA-T8	
C211	800				DD-801	L10T8			5GA-T8	
C212	1000		961969	EF-001	MFT-1000				503C-D1	
C213	.5-3		961970		829-3		3115-D	CT565A		
C214	59									N750
C215	59									N750
C216	1.8									10%
C217	2.2									10%
C218	.5-3		961970		829-3		3115-D	CT565A		
C219	.39									
C220	2.2									NPO 10%
C221	1000		961969	EF-001	MFT-1000				503C-D1	
C222	1000			EF-001	MFT-1000				503C-D1	
C223	6.8			NPO-DI 6.8	DTZ-6R8	C10V68C	TCO-6.8	ZT-5568	5TCCB-V68	NPO 10%
C224	10			NPO-DI 10	DTZ-10		TCO-10			NPO 5%
C225			928878							
C226	1.5									N2200 ± .25mmf
C227	68				DTN-68		TC7-68			N750 5%
C228	1000			EF-001	MFT-1000				503C-D1	
C229	800				DD-801	L10T8			5GA-T8	

① Some versions may use 3mmf NPO 10% in this application.
② Some versions may use 2.2mmf NPO 10% in this application.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		EMERSON PART No.	NOTES
	OHMS	WATT		
R201	680K			
R202	6800Ω			
R203	1.5meg			
R204	1meg			
R205	1000Ω			
R206	33K			
R207	100K			

ITEM No.	RATING		EMERSON PART No.	NOTES
	OHMS	WATT		
R208	270Ω			
R209	1500Ω			
R210	47K			
R211	1800Ω			
R212	4700Ω			
R213	15K			
R214	4700Ω			

COILS (RF-IF)

ITEM No.	USE	EMERSON PART No.	NOTES
L201	Ant. Matching Trans.	962168	Includes traps and assy.

ITEM No.	USE	EMERSON PART No.	NOTES
L202	Ant. RF, Mixer Grid & Osc. Coils	962169	Includes complete rotor assy.
L203	Mixer Plate Coil	962170	

TUNER ALIGNMENT INSTRUCTIONS

OSCILLATOR ALIGNMENT FOR TUNER #471039

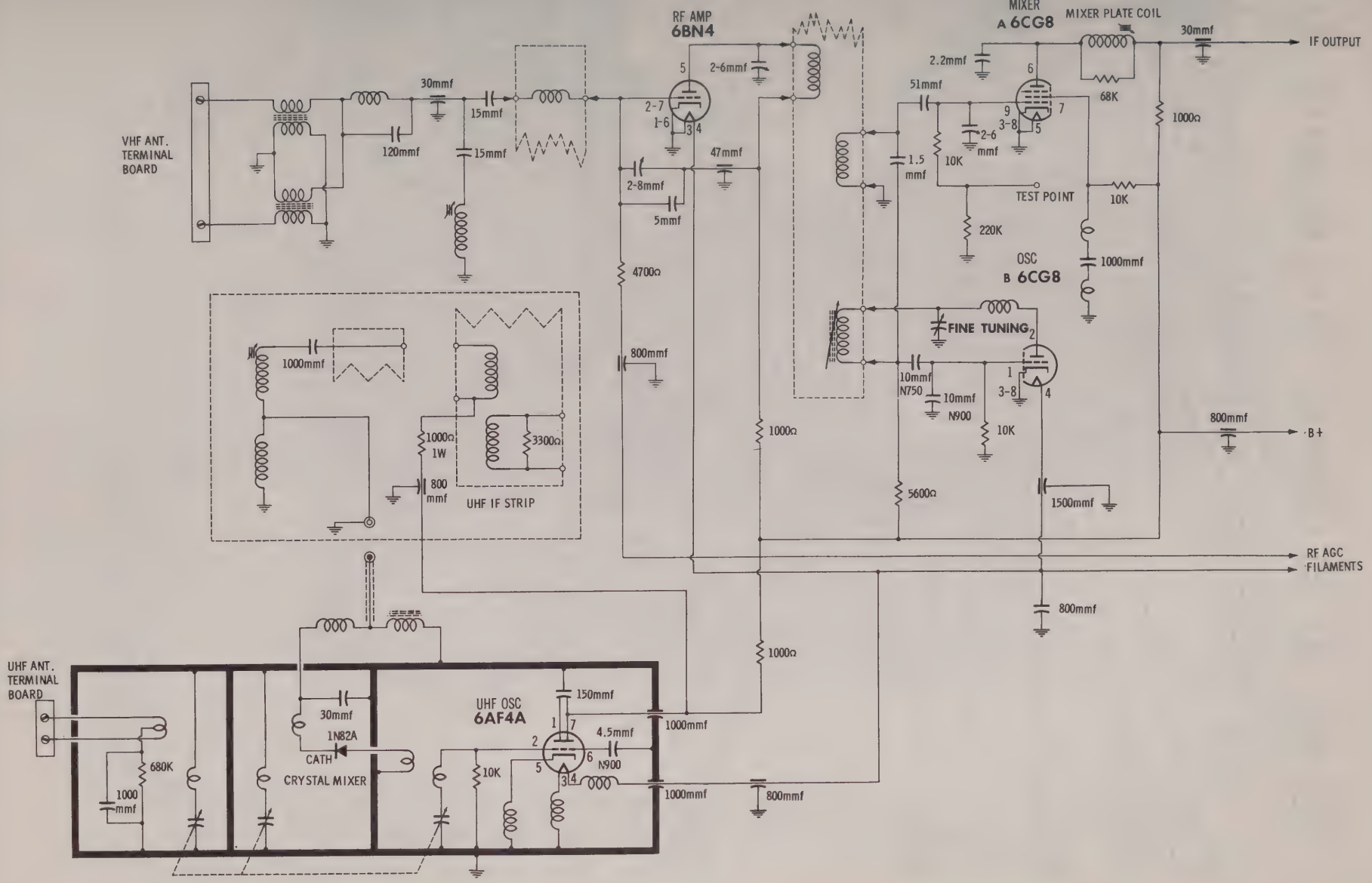
Channel 13 oscillator adjustment slug (A201) is also used for adjusting the other high band (12 thru 7) channels. Channel 6 oscillator adjustment slug (A202) is also adjusted for channel 5. Channel 4 oscillator adjustment (A203) is also adjusted for channel 3. Channel 2 oscillator slug (A204) is used only for channel 2.

Turn the set on and tune in the highest high band channel and adjust controls for normal operation. Set fine tuning to the center of its range. Adjust A201 for best picture and sound. Switch to next high band channel. If necessary to adjust, do so by bending coil loop appearing at the hole to left of tuner shaft for best picture and sound.

Switch channel selector to the highest low band channel (6 thru 2) operating in the area. Adjust proper slug for best picture and sound. If channel 5 or 3 needs adjusting, it will be necessary to switch to the next higher channel, adjust slug SLIGHTLY, then switch back to the channel needing adjustment and check picture. Repeat until proper results are obtained. Repeat procedure until all channels operating in the area have been properly adjusted.

RF AND MIXER ALIGNMENT

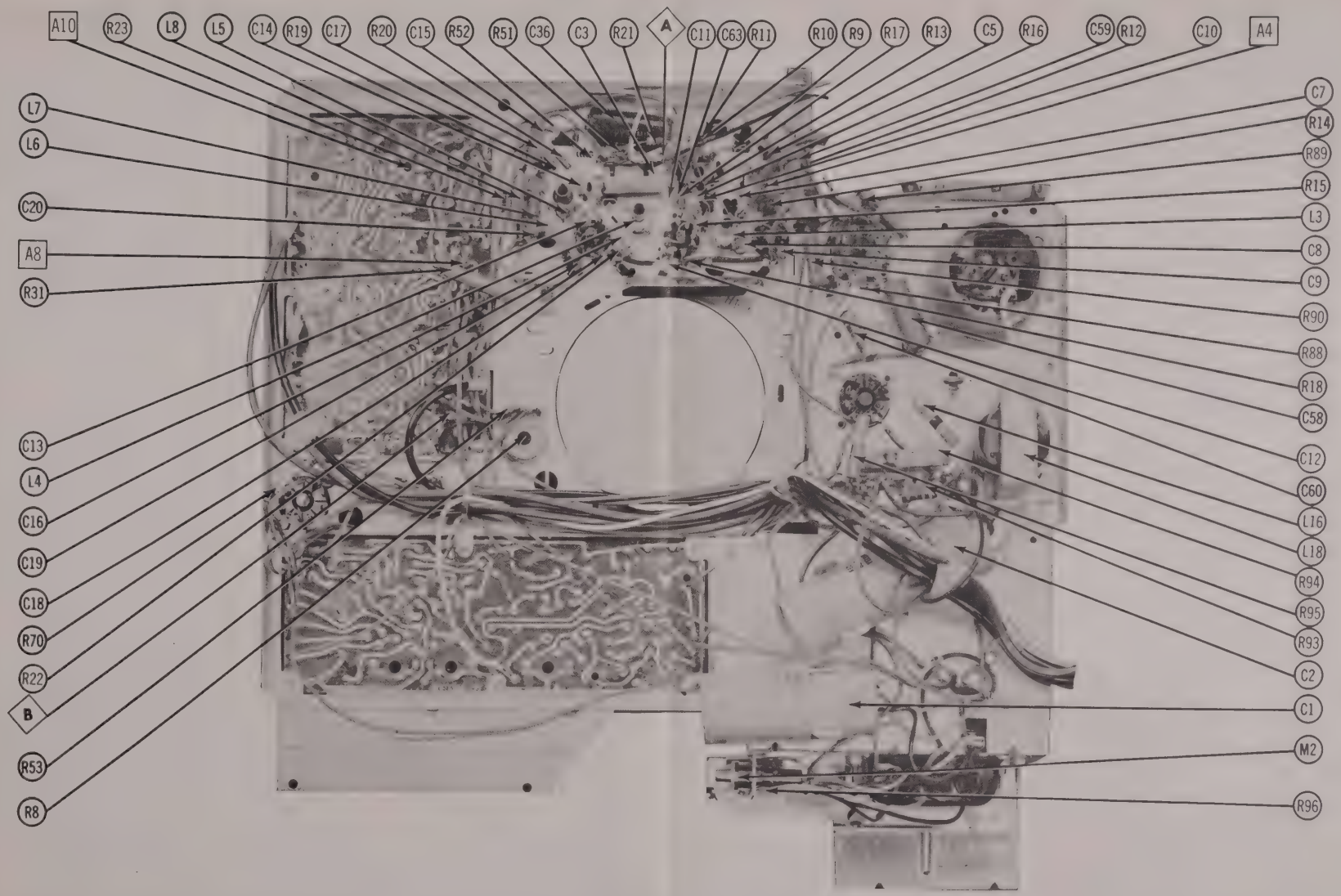
This portion of the receiver has been properly aligned at the factory and is very stable. Alignment of this portion should not be required in the field.



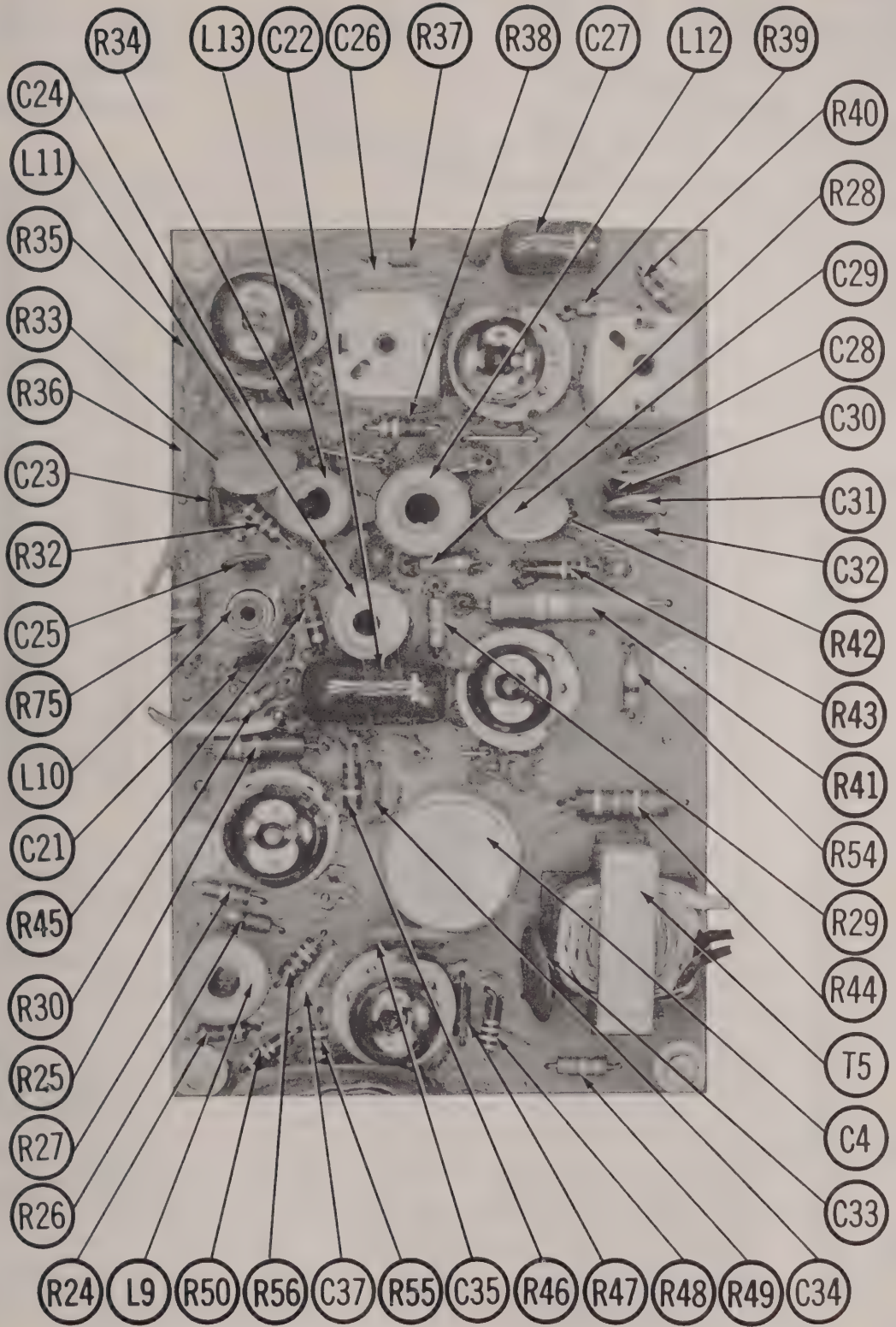
A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1958

TUNER #471035, 471036, 471037

EMERSON MODELS 1404, 1405, 1418, 1419, 1420, 1421,
1424, 1425, 1426, 1428 (Ch. 120369C, 120370G, 120377C,
120400S, 120401U, 120403S, 120404U)



CHASSIS BOTTOM VIEW



VIDEO, AGC, SYNC & SOUND PRINTED BOARD

SET 400 FOLDER 3

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	1st. Video IF Amp.	6CB6	
V2	2nd. Video IF Amp.	6CB6	
V3	3rd. Video IF Amp. - Video Det.	6AS8	
V4	Video Output	12BY7A	
V5	AGC Keying-Sound IF Amp.	6AN8	
V6	Audio Det.	6DT6	
V7	Audio Output	6AQ8	
V8	Sync Sep.	8BY8	
V9	Sync Phase Inv. -Vert. Mult.	6CG7	
V10	Vert. Mult. -Vert. Output	6V6GT	
V11	Horiz. Mult.	6CG7	
V12	Horiz. Output	6DQ6A	*6CU8
V13	Damper	6AX4GT	
V14	HV Rect.	1B3GT	
V15	LV Rect.	5U4GB	

* Alternate

PICTURE TUBE

ITEM No.	REPLACEMENT DATA: EMERSON PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	SYLVANIA PART No.	NOTES
V16	21CBP4A		21CBP4 ①	21CBP4/ 21CBP4A ②	① "Silversma" ③ ② "Silver Screen 85"

ELECTROLYTIC CAPACITORS

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: EMERSON PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	80	300	925427 ①	PR4-800	BBRQ0954	WQ650	TMQ-8	Q-237	TVA-4659
B	10	300							
C	40	250							
C2A	80	300	925405	PR4-700	BBRQ0805	WQ650	TMT-109	T-552	TVA-4659
B	40	300							
C	100	50							
C3	1	25	925293	PR850V2	BBR2-50	TC302	TD-2-25	MT-0502	TVA-1201
C4A	a2	300	925428	AFH2-81-95				MMT-0220	R2650 *
B	a20	25						MMT-3003	

* Non-catalog item.
① Some versions may use 80-40-10mfd @ 300-300-300V in this application (Part #925423).

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: EMERSON PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C5	1000		923819	BPD-001	DD-102	BYA5DI	ED-1000	DC521	SHK-DI	
C6	34		923960							N330 5%
C7	1000		923833	BPD-001	DD-102	BYA5DI	ED-1000	DC521	SHK-DI	
C8	680		923909		D5-681	5R5T68	ED-680		M5-368	10%
C9	1000		923833	BPD-001	DD-102	BYA5DI	ED-1000	DC521	SHK-DI	
C10	1000		923833	BPD-001	DD-102	BYA5DI	ED-1000	DC521	SHK-DI	
C11	470		923907		D5-471	5R5T47	ED-470		M5-347	10%
C12	1000		923833	BPD-001	DD-102	BYA5DI	ED-1000	DC521	SHK-DI	
C13	330		923905	BPD-00033	DD-331	L10T33	ED-330	UC-5333	SGA-T33	
C14	4700		923923	BPD-0047	DD-472	BYA10D47	ED-0047	UC-5247	SGA-D47	
C15	1000		923833	BPD-001	DD-102	BYA5DI	ED-1000	DC521	SHK-DI	
C16	1000		923911			1R5DI	ED-1000	MC9251	M5-3i	10%
C17	1000		923833	BPD-001	DD-102	BYA5DI	ED-1000	DC521	SHK-DI	
C18	1000		923833	BPD-001	DD-102	BYA5DI	ED-1000	DC521	SHK-DI	
C19	5.3		928887							N750
C20	6.8		928896	N750-DI 6.8	DTN-6R8	C10V68U	TC7-6.8			N760
C21	47		928895	N750-DI 47	DTN-47	C10Q47U	TC7-47		BTCU-Q47	N750 10%
C23	1	400	921515	P488N-1		DF-104	CUB4P1	GEM-401	4TM-P1	
C23	470		923816	BPD-00047	DD-471	BYA10T47	ED-470	UC-5347	SGA-T47	
C24	10000		923924	BPD-01	DD-103	BYA5EI	ED-E1	DC521	SHK-EI	
C25	47		928895	N750-DI 47	DTN-47	C10Q47U	TC7-47		BTCU-Q47	N750 10%
C26	1000		923833	BPD-001	DD-102	BYA5DI	ED-1000	DC521	SHK-DI	
C27	.47	200	921314	P388N-47	DF-503	CUB2F47		GEM-4147	4TM-F47	
C28	10000		923924	BPD-01	DD-103	BYA5EI	ED-01	DC511	SHK-SI	
C29	10000		923924	BPD-01	DD-103	BYA5EI	ED-01	DC511	SHK-SI	
C30	470		923816	BPD-00047	DD-471	BYA10T47	ED-470	UC-5347	SGA-T47	
C31	2200		923921	BPD-0022	DD-222	BYA10D22	ED-0022	UC-5223	SGA-D22	
C32	10000		923924	BPD-01	DD-103	BYA5EI	ED-01	DC511	SHK-SI	
C33	4700		923924	BPD-0047	DD-472	BYA10D47	ED-0047	UC-5247	SGA-D47	
C34	470		923816	BPD-00047	DD-471	BYA10T47	ED-470	UC-5347	SGA-T47	
C35	3300		923958	BPD-0033	DD-0033	BYA10D33	ED-0033	UC-5333	SGA-D33	
C36	.47	200	924355	P388N-47		CUB2P47		GEM-4047	4TM-P47	
C37	10000		923924	BPD-01	DD-103	BYA5EI	ED-01	DC511	SHK-SI	
C38	10000		923924	BPD-01	DD-103	BYA5EI	ED-01	DC511	SHK-SI	
C39	1000		923819	BPD-001	DD-102	BYA5DI	ED-1000	DC521	SHK-DI	
C40	4700		923823	BPD-0047	DD-472	BYA10D47	ED-0047	UC-5247	SGA-D47	
C41	.0047	400	924453					GEM-16247		10%
C43	1000		923833	BPD-001	DD-102	BYA5DI	ED-1000	DC521	SHK-DI	
C43	.13	400	924418							10%
C44	.1	400	921515	P488N-1	DF-104	CUB4P1		GEM-401	4TM-P1	
C45	.01	400	924514	P488N-01	D5-103	CUB4E1	GP-10000	GEM-411	4TM-E1	
C46	1000		923833	BPD-001	DD-102	BYA5DI	ED-1000	DC521	SHK-DI	
C47	680		923917	BPD-00068	D6-681	BYA10T68	ED-680	UC-5368	SGA-T68	
C48	680		923917	BPD-00068	D6-681	BYA10T68	ED-680	UC-5368	SGA-T68	
C49	1000	1000	923899	DAC-3		DCH5-1003	ED-1000	DC302	SGA-DI	
C50	3300		923958			1R5D33			M5-333	10%
C51	.015	300	924320	P388N-015	DD16-153	CUB4E15	ED-015	GEM-4115	4TM-E15	
C52	1000		923819	BPD-001	DD-102	BYA5DI	ED-1000	DC521	SHK-DI	
C53	.0047	400	921453					GEM-16247		10%
C54	100		921161		1469-0001	D6-101	5R5T1	ED-100	MC9231	M5-31 10%
C55	330		921165		1469-00022	D6-331	5R5T33	ED-330		M5-322 10%
C56	390		921168		1469-00039	D6-391	5R5T39	ED-390		M5-339 10%
C57	4700		923923	BPD-0047	DD-472	BYA10D47	ED-0047	UC-5247	SGA-D47	
C58	.1	400	924515	P488N-1	DF-104	CUB4P1		GEM-401	4TM-P1	
C59	.22	200	923335	P388N-23		CUB2P23		GEM-3022	RTM-P22	
C60	.01	400	923514	P488N-01	D6-103	CUB4E1	GP-10000	GEM-411	4TM-E1	
C61	.1	400	924515	P488N-1	DF-104	CUB4P1		GEM-401	4TM-P1	
C62	100	3000	923852							10%
C63	1000		923833	BPD-001	DD-102	BYA5DI	ED-1000	DC521	SHK-DI	

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: EMERSON PART No	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500Ω	½	390499				U21168	Contrast
B	1meg	½					Not Req.	Volume
C	Switch						Not Req.	
R2A	1meg	½	390534	B-70	A47-1meg-Z	Q13-137	U53	Tone
B	Shaft			Not Req.	F8-3	Not Req.	Not Req.	
R3A	200K	½	390436	B-46	A47-200K-S	Q11-129	U43	Brightness
B	Shaft			Not Req.	F8-3	Not Req.	Not Req.	

CONTROLS (cont)

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: EMERSON PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R4A	50K	½	390533	F1-39		■• (QJ-965	•• (UK3809	Horiz. Hold
B	1.5meg	½		R3-84				Vert. Hold
R5	2meg	½	390403					Vert Size
R6	1500Ω	½	390461					Vert. Lin.
R7	200K	½	390475					Horiz. Balance
R8A	5meg	1	390497	AB-87	A47-5meg-B	B11-161	PTA56L	Local-Distance
B	Shaft			AK-1	FKH-1/4	8kΩ	Not Req.	

• "Concentrikit" Equivalent: K-4 Kit, Base Elements & Shafts B11-123 (Panel) B11-136 (Rear)

■ Not available as a factory assembled control.
•• "STA-LOC" Equivalent: FD641., OF2167, RU155L, B2837.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING: OHMS	RATING: WATT	EMERSON PART No.	NOTES
R9	1000Ω		340492	
R10	470Ω		350412	
R11	150K		340103	Note 1
R12	22K		340812	
R13	470Ω		350412	
R14	56Ω		340192	
R15	12K		340752	
R16	470Ω		350412	
R17	470Ω		350412	
R18	56Ω		340192	
R19	1500Ω		350512	
R20	1500Ω		350512	
R21	470Ω		350412	
R22	180Ω		340312	
R23	15K		340722	
R24	4700Ω		340652	
R25	15K	1	370722	
R26	15Ω		340052	
R27	560Ω		340432	
R28	2200Ω		340572	
R29	22K		340812	
R30	150K		341012	
R31	5000Ω	4	397112	
R32	47K		340892	
R33	82K		340952	
R34	120K	1	370992	
R35	470K		341132	
R36	1.5meg		341252	
R37	2700Ω		340592	
R38	100K		340972	
R39	150K		341012	
R40	560K		341152	
R41	12K	2	780755	
R42	560Ω		340432	
R43	470K		351132	
R44	2700	1	370352	
R45	22K		340812	
R46	220K		351052	
R47	2.2meg		351292	
R48	390K		341112	
R49	82K		340952	
R50	470K 5%		341132	
R51	15meg		351492	
R52	470K		341132	

ITEM No.	RATING: OHMS	RATING: WATT	EMERSON PART No.	NOTES
R53	2.2meg		351292	
R54	10K		350732	
R55	470K		341132	
R56	39K		340872	
R57	1meg		351312	
R58	10K		340732	
R59	3300Ω		340612	
R60	3300Ω		340612	
R61	100K		340972	
R62	68K		340932	
R63	33K		340852	
R64	330K		341092	
R65	2.2meg		341292	
R66	2.2meg		341292	
R67	680Ω		340452	Note 2
R68	330Ω		350372	
R69	2.2meg		351292	
R70	100Ω		350252	
R71	150K		341012	
R72	560Ω		340432	
R73	560Ω		340432	
R74	10K		340732	
R75	82K	1	370962	
R76	68K		340932	
R77	100K		340972	
R78	100K		340972	
R79	10meg		351453	
R80	2.2meg		351292	
R81	15K		340772	
R82	1200Ω		340512	
R83	47K		340892	
R84	47K		340892	
R85	120K		340992	
R86	6800Ω		340692	
R87	470K		341132	
R88	1000		350252	
R89	8200Ω	2	780712	
R90	100Ω	2	780252	
R91	18Ω		340072	
R92	10K		340732	
R93	470Ω	2	780412	
R94	2700Ω	10	394200	
R95	22K	2	780812	
R96	470K		351132	

Note 1. Some versions use 100K in this application (Part #340972).
Note 2. Not used in Ch. 120377C, 120400E, 120401U, 120403E, 120404U.

TRANSFORMER (POWER)

ITEM No.	RATING: PRI.	RATING: SEC. 1	RATING: SEC. 2	REPLACEMENT DATA: EMERSON PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117VAC @1.7A	540VCT @.280A	5VAC @3A	730074						
		SEC. 3	SEC. 4	SEC. 5						
		6.3VAC @8.2A								

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA: EMERSON PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	Vert. Output	736147	Z1900 ①		V307	A-8144		A-108X	
T3A	Yoke-Horiz. (30MH)	705332	DF607	MDF-92	Y90F19/43	DY-16A	Y-16	Y-41 &	
B	(909)-Vert. (38MH)		②③	②④	②④	②③④	②③	NW5 ②	
M6	Rear Cover & Centering Device	708333							
T4	Horiz. Output	736149							

① Use 8 to 1 turns ratio.
② Use original rear cover and centering device. Connect same as original. Cut and form a piece of .010 gauge fish paper inside the yoke itself and support with an acetate cement, to provide an insulation between the width sleeves and the yoke proper.
③ Use original damping network, if necessary

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE: PRI.	IMPEDANCE: SEC.	EMERSON PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T5	4800Ω	8Ω Tap ② 3Ω	734163							

SPEAKER

ITEM No.	TYPE: SIZE	FIELD	V. C. IMP.	REPLACEMENT DATA: EMERSON PART No.	QUAM PART No.	NOTES
SP1	6"	PM	3-4Ω	180170 ①	6A1	① Used in Models 1404, 1405, 1420, 1421, 1425
	6"	PM		180171 ②		② Two used in Models 1424, 1425, 1426
	4" x 6"	PM		180179 ③		③ Used in Models 1418, 1419
	4"	PM		180174 ③		

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA: EMERSON PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1	41.25MC Trap	708213					Includes 47.25MC Trap
L2	1st. Video IF	732089					
L3	2nd. Video IF	732238	17-4533 *	TV-130 *	6219 *	VF-3 *	
L4	3rd. Video IF	732238	17-4533 *	TV-130 *	6219 *	VF-3 *	
L5	4th. Video IF	732347	17-4533 *	TV-130 *	6219 *	VF-3 *	
L6	RF Choke	705094	19-1004	BC-565	4610		6.8 Microhenries, IRC Part #CLA
L7	RF Choke	705014	19-5022	TV-180	6152		20 Microhenries
L8	Series Peaking Coil	708090	19-3075	TV-186	6172	VF-2	80 Microhenries
L9	Shunt Peaking Coil	708279	19-3500	TV-203	6176	VF-8	500 Microhenries
L10A	4.5MC Trap	730297					
B	1st. Sound IF						
L11	Series Peaking Coil	708273	19-4400	TV-202	6130		440 Microhenries
L12	Shunt Peaking Coil	708338	19-4950	TV-208	6167		1000 Microhenries
L13	Shunt Peaking Coil	708335	19-3300	TV-199	6155		300 Microhenries
L14	2nd. Sound IF	730298					Includes caps.
L15	Quadrature Coil	730299					Includes cap.
L16	RF Choke	705021	19-1005	BC-566	4612		10 Microhenries, IRC Part #CL-1

* Drill new mounting hole.

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES.: PRI.	DC RES.: SEC.	REPLACEMENT DATA: EMERSON PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	Thordarson PART No.	NOTES
L17	50Ω		716121						

FILTER CHOKE

ITEM No.	RATINGS: CURRENT (Measured)	RATINGS: DC RES.	REPLACEMENT DATA: INDUCTANCE @ CURRENT 1000 ^-1	EMERSON PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L18	.345A	20Ω	.53 Hy.	7307036	C5041 ①			C-2328 ①	26C82 ①	

① Drill new mounting hole.

RECTIFIERS

ITEM No.	RATING: CURRENT (Measured)	REPLACEMENT DATA: EMERSON PART No.	FEDERAL PART No.	GENERAL ELECTRIC PART No.	INTERNATIONAL PART No.	SARKES TARZIAN PART No.	NOTES
M1		817963 ①	1215 ①②	17I ①②			① Selenium type. ② Two required.

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA: EMERSON PART No.	LITTELFUSE PART No.	BUSS PART No.
			FUSE / HOLDER	FUSE / HOLDER	FUSE / HOLDER
M2	W	6/10A-125V-8/B	808015	333.600 (W 6/10A-125V-8/B) / 346010	W 6/10 / HW 1/3 to 3/4

MISCELLANEOUS

ITEM No.	PART NAME	EMERSON PART No.	NOTES
M3	Lamp	807000	#47
M4	Tuner	471039	VHF - Ch. 120377C, 120389C
	Tuner	471035	VHF - Ch. 120400E, 120403E
	Tuner	471040	UHF-VHF - Ch. 120370G
	Tuner	471036	UHF-VHF - Ch. 120401U, 120404U
	Tuner	471037	UHF - Ch. 120402U, 120404U
M5	Width Sleeve	412302	
M6	Centering Device	708333	Includes yoke rear cover
	Switch	510133	Activating
	Switch	811414	Motor
	Motor	811316	Power Tuning, Includes switch
	Printed Board	471051	Video, AGC, Sync & Sound
	Printed Board	471050	Horiz. & Vert. Osc.

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Safety Glass	520255	Models 1420, 1421, 1424, 1425, 1426, 1428
Safety Glass	520258	Models 1404, 1405, 1418, 1419
Mask	460824	Models 1404, 1405, 1418, 1419
Knob	460786	On-Off-Volume - Models 1420, 1421, 1424, 1425, 1426, 1428
Knob	460922	On-Off-Volume - Models 1404, 1405
Knob	460979	On-Off-Volume - Models 1418, 1419
Knob	460963	Vert. Hold, Horiz. Hold, Contrast - Models 1420, 1421, 1424, 1425, 1426, 1428
Knob	460713C	Vert. Hold, Horiz. Hold, Brightness - Models 1404, 1405, 1418, 1419
Knob	460788	Tone, Brightness - Models 1420, 1421, 1424, 1425, 1426, 1428
Knob	460918	Contrast - Models 1404, 1405
Knob	460918A	Contrast - Models 1418, 1419
Knob	460861	VHF Channel Selector - Models 1420, 1424, 1426, 1428
Knob	460861B	VHF Channel Selector - Models 1421, 1425
Knob	460920	VHF Channel Selector - Model 1404
Knob	460920A	VHF Channel Selector - Model 1418
Knob	460928	UHF-VHF Channel Selector - Model 1405
Knob	460928A	UHF-VHF Channel Selector - Model 1419
Knob	460861B	UHF Channel Selector - Models 1421, 1425
Knob	460923	UHF Channel Selector - Model 1405
Knob	460923A	UHF Channel Selector - Model 1419
Knob	460918	Fine Tuning - Models 1404, 1405, 1420, 1424, 1426, 1428
Knob	460926	Fine Tuning - Models 1421, 1425
Knob	460918A	Fine Tuning - Models 1418, 1419
Knob	460963	UHF Fine Tuning - Models 1421, 1425
Knob	460922	UHF Dial - Model 1405
Knob	460921A	UHF Dial - Model 1419
Knob	460758	UHF Dial - Models 1421, 1425
Knob	460757	VHF Dial - Models 1421, 1425
Knob	460835	Radio-Phono - Models 1418, 1419
Knob	460980	Radio Controls - Models 1418, 1419
Knob	460833	Radio Tuning - Models 1418, 1419

EMERSON MODELS 1404, 1405, 1418, 1419, 1420, 1421, 1424, 1425, 1426, 1428 (Ch. 120369C, 120370G, 120377C, 120405, 120401U, 120403U, 120404U)

FOLDER 2

PARTS LIST AND DESCRIPTIONS (Continued)

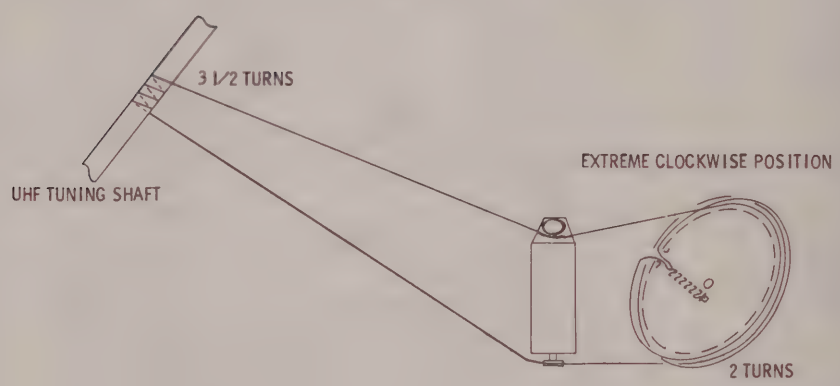
CABINETS & CABINET PARTS (cont)

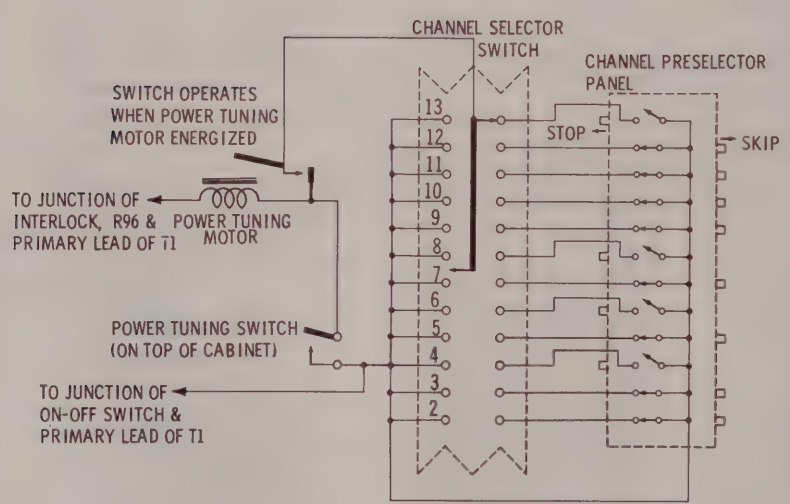
NAME	PART NO.	DESCRIPTION
Cabinet	140867	Mahogany - Models 1420, 1428
Cabinet	140867A	Blond - Models 1420, 1428
Cabinet	140867B	Ebony - Models 1420, 1428
Cabinet	140885	Mahogany - Model 1421
Cabinet	140885A	Blond - Model 1421
Cabinet	140885B	Ebony - Model 1421
Cabinet	140883	Mahogany - Models 1424, 1426
Cabinet	140883A	Blond - Models 1424, 1426
Cabinet	140883B	Walnut - Models 1424, 1426
Cabinet	140886	Mahogany - Model 1425
Cabinet	140886A	Blond - Model 1425
Cabinet	140886B	Walnut - Model 1425

WIRING DATA

High Voltage Lead	Use BELDEN No. 8869
Shielded Hook-up Wire	Use BELDEN No. 8885 (Single Conductor) 8738 (Two Conductor)
General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord (Interlock Type)	Use BELDEN No. 8874
300Ω Tuner Input Lead	Use BELDEN No. 8225
300Ω Antenna Lead-in	Use BELDEN No. 8230 or 8275
Antenna Rotor Cable	Use BELDEN No. 8464 (Flat) or 8484 (Round) - 4 Conductor 8485 (Round) - 5 Conductor 8488 (Round) - 8 Conductor

UHF DIAL CORD STRINGING

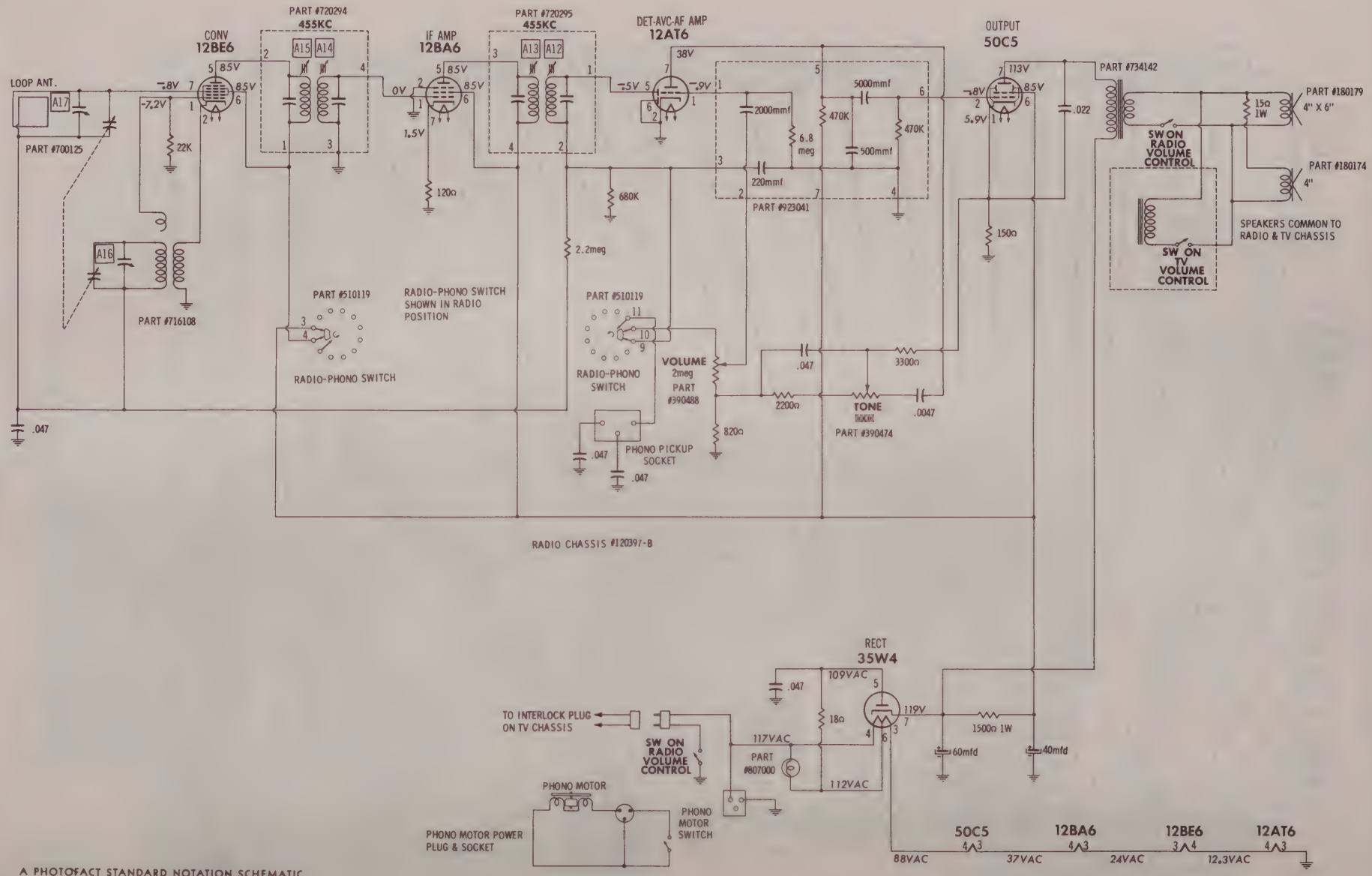




MOTORIZED TUNING ASSEMBLY
(USED ON CHASSIS
120369-C ONLY)

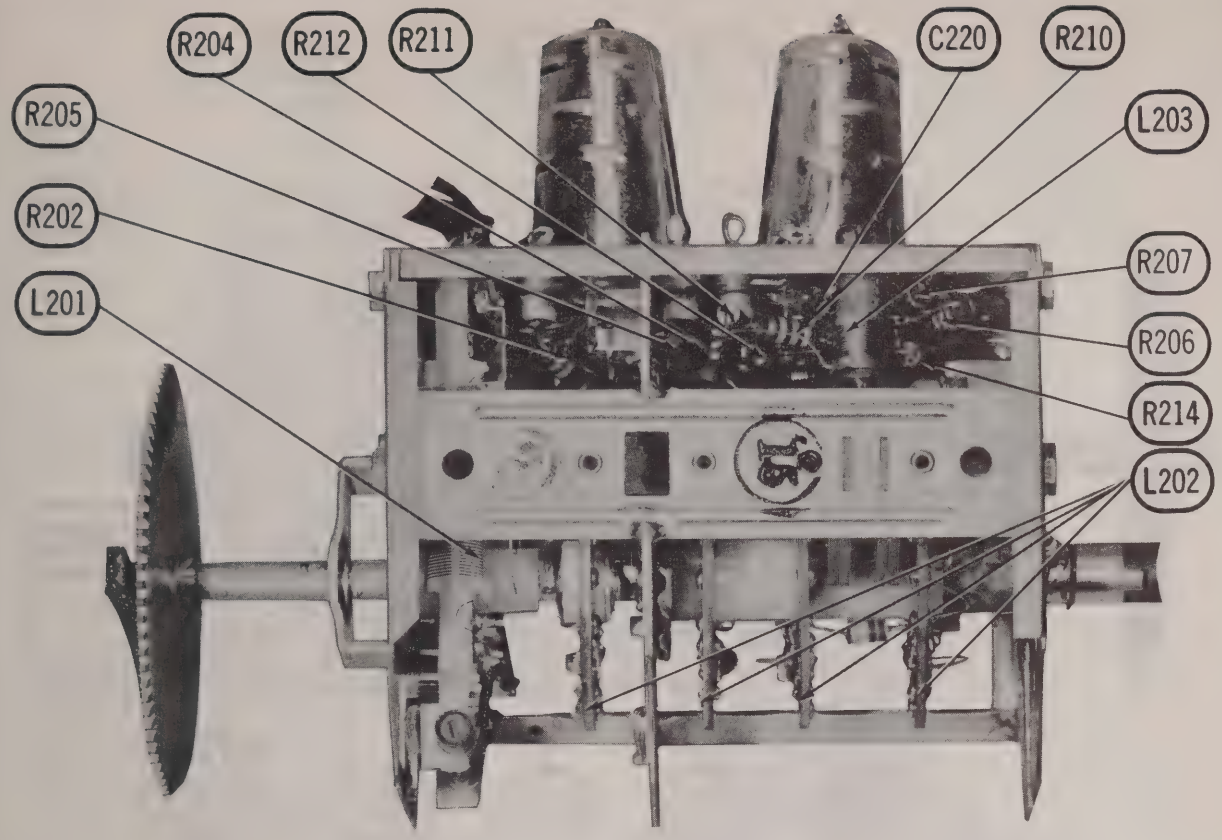
A PHOTOFACT STANDARD NOTATION SCHEMATIC

Howard W. Sams & Co., Inc. 1958

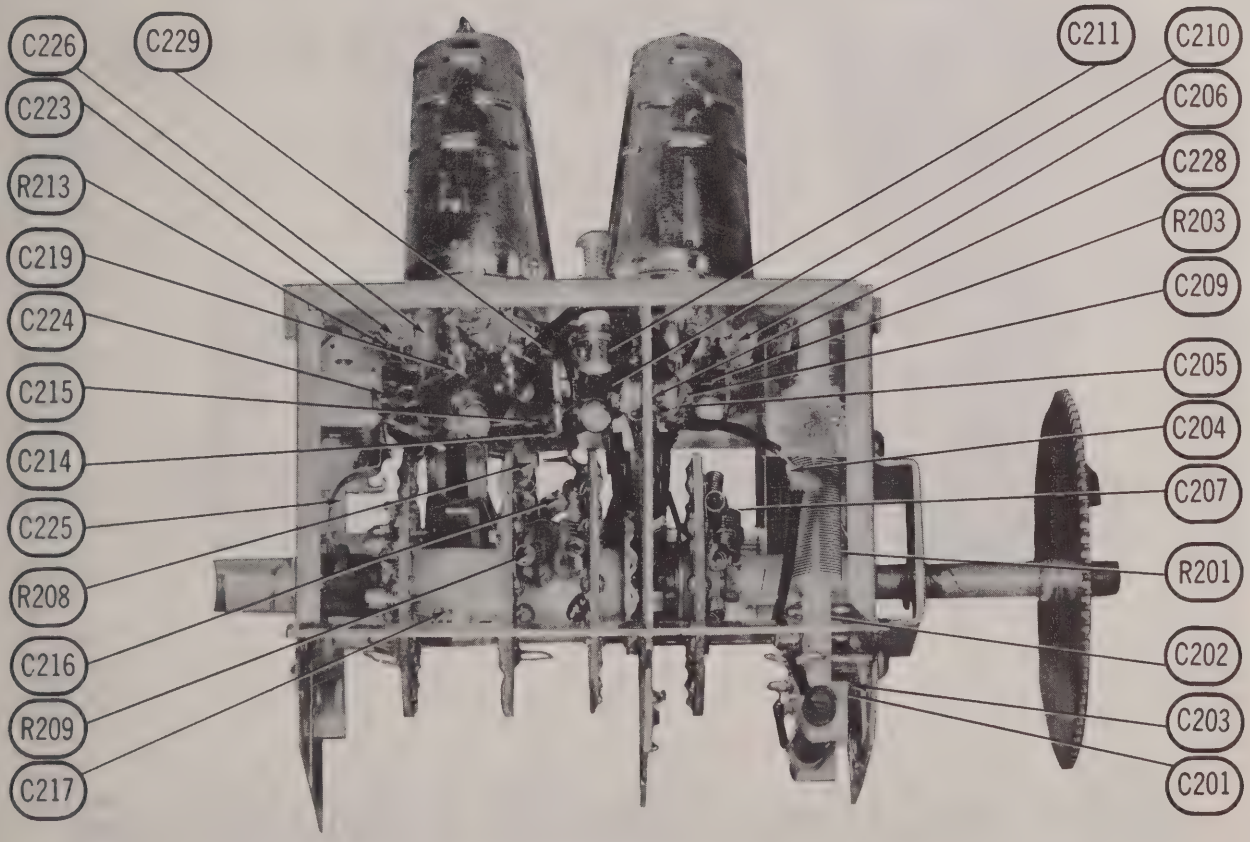


A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1958

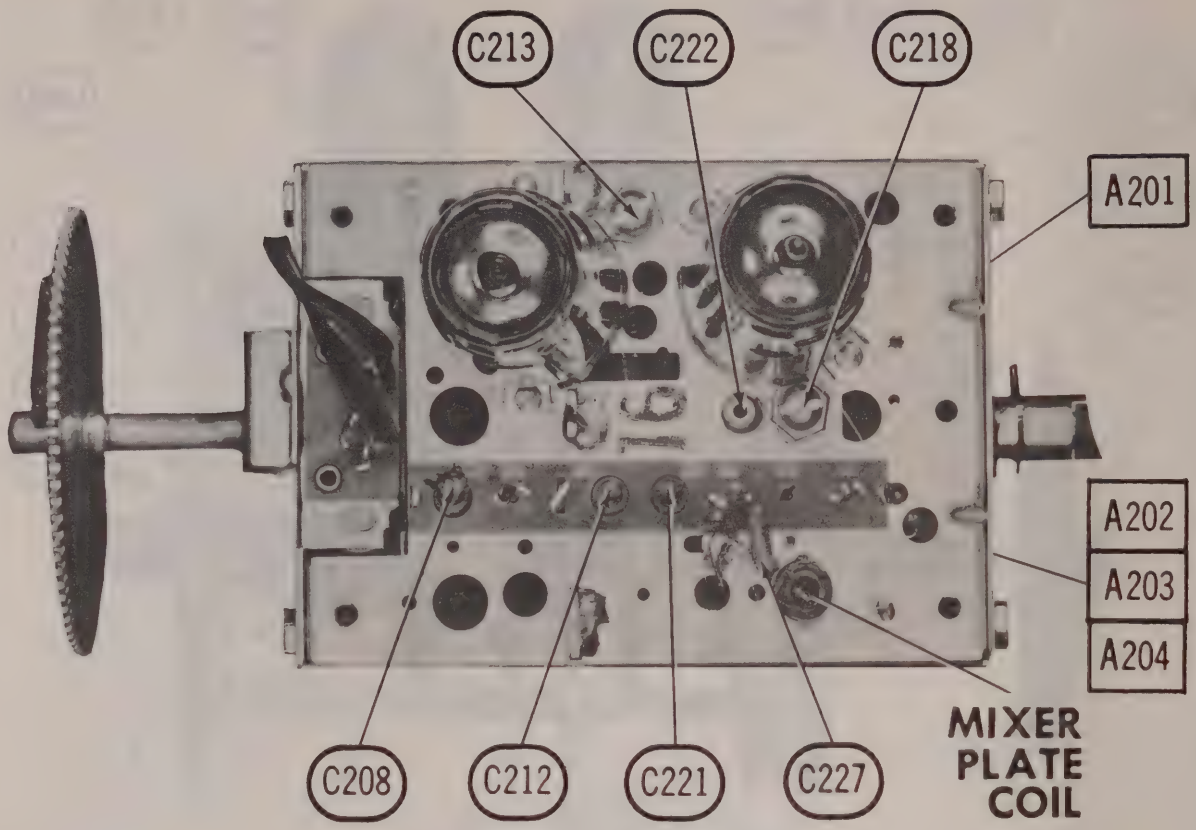
RADIO CHASSIS 120397B



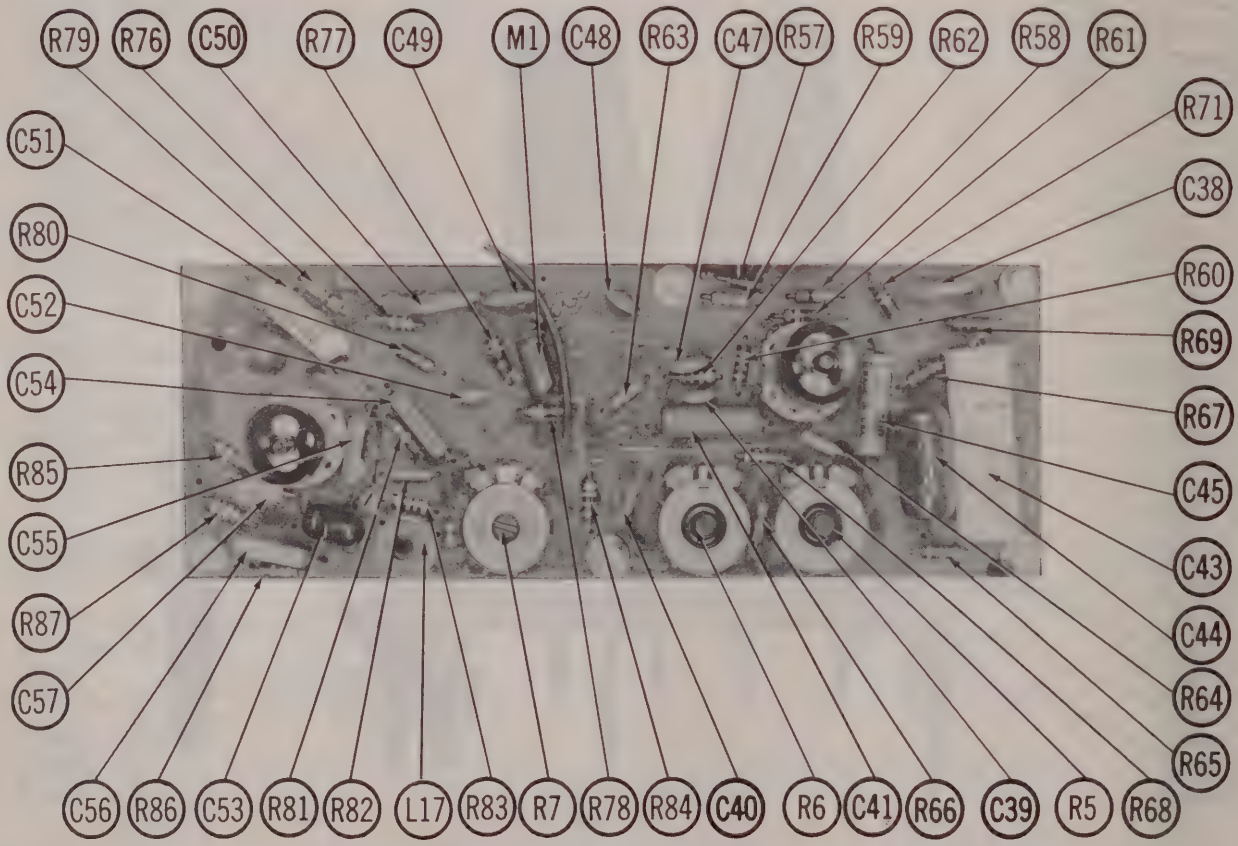
RF TUNER-LEFT SIDE



RF TUNER-RIGHT SIDE



RF TUNER-TOP VIEW



HORIZ & VERT OSC PRINTED BOARD

CHASSIS TOP VIEW

RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6CB6	120K	56Ω	.1Ω	0Ω	†3200Ω	†3200Ω	0Ω		
V2	6CB6	120K	56Ω	.1Ω	0Ω	†3200Ω	†3200Ω	0Ω		
V3	6AS8	†4600Ω	.1Ω	180Ω	.1Ω	0Ω	4700Ω	0Ω	.1Ω	†1500Ω
V4	12BY7A	• 50Ω	4700Ω	0Ω	0Ω	0Ω	.1Ω	†5000Ω	†15K	0Ω
V5	6AN8	†100K	2.2Ω	2700Ω	.1Ω	0Ω	530K	‡110K	†52K	†490Ω
V6	6DT6	7Ω	560Ω	.1Ω	0Ω	†470K	†12K	560K		
V7	6AQ5	0Ω	270Ω	0Ω	.1Ω	†335Ω	†490Ω	0Ω		
V8	6BY6	340K	0Ω	0Ω	.1Ω	†60K	†22K	2.2meg		
V9	6CG7	•‡2.5meg	• 580K	0Ω	.1Ω	0Ω	†14K	†1meg	3300Ω	0Ω
V10	6V6GT	NC	.1Ω	†370Ω	†20Ω	2.2meg	TP	0Ω	• 580Ω	
V11	6CG7	†120K	• 120K	1200Ω	0Ω	.1Ω	†15K	1.6meg	1200Ω	0Ω
V12	6DQ6A	TP	.1Ω	NC	†8700Ω	470K	TP	0Ω	100Ω	TOP CAP ‡36Ω
V13	6AW4GT	NC	NC	¶	NC	†27Ω	NC	0Ω	.1Ω	
V14	1B3GT	PINS 1 THRU 8 HAVE INFINITE RESISTANCE								TOP CAP ‡485Ω
V15	5U4GB	NC	¶	NC	23Ω	NC	21Ω	NC	¶	
V16	21CBP4A	0Ω	10K	PIN 6 †20Ω	PIN 10 ‡18Ω	PIN 11 • 180K	PIN 12 .1Ω			
V201	6BQ7A	†1500Ω	570K	INF	.1Ω	0Ω	INF	1.6meg	0Ω	0Ω
V202	6AT8	15K	†6500Ω	0Ω	0Ω	.1Ω	†4000Ω	†6500Ω	0Ω	130K
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9

¶ THIS READING CAN VARY GREATLY, (10K MINIMUM), DUE TO THE CONDITION OF THE ELECTROLYTIC CAPACITOR CONNECTED IN THE ASSOCIATED CIRCUIT.

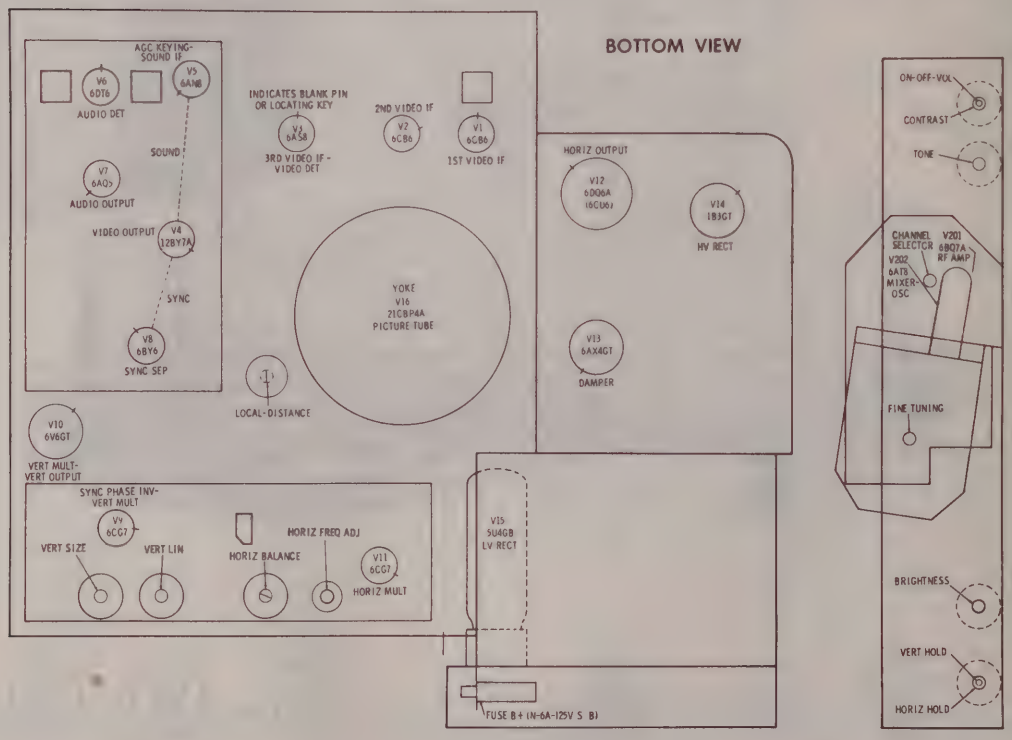
• THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.

† MEASURED FROM PIN 8 OF V15.

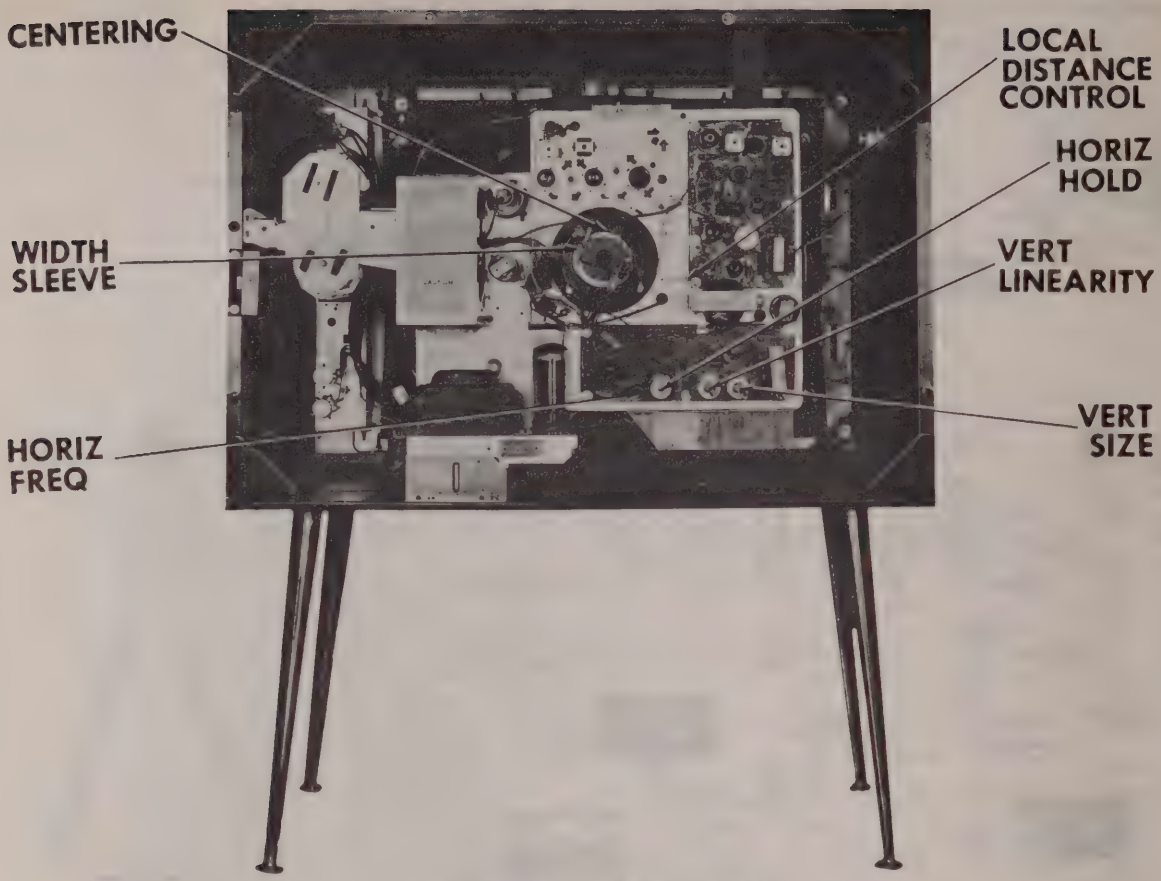
‡ MEASURED FROM PIN 3 OF V13.

NC NO CONNECTION.

TP TIE POINT.



TUBE PLACEMENT CHART



CABINET—REAR VIEW

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

Models 1420, 1421, 1424, 1425, 1426, 1428.

1. Remove 8 push-on type knobs from the front.

2. Remove 6 metal screws from the rear cover. Remove the rear cover.

3. Remove the picture tube socket, yoke clamp, width sleeve, HV lead and speaker leads.

4. Loosen 2 metal screws holding the antenna terminal board.

5. Remove the metal screw holding the tuning support bracket to the left side of the cabinet and 5 metal screws holding the control panel to the front of the cabinet.

6. Remove 2 metal screws holding the top chassis brackets and 4 metal screws holding the bottom chassis brackets.

7. Remove the chassis and yoke.

Models 1404, 1405, 1418, 1419.

1. Remove push-on type knobs from the front.

2. Remove the screws holding the trim strips at the top edge of the safety glass.

3. Tilt the safety glass out at the top and lift to remove.

4. Remove 2 metal screws holding mask. Remove mask.

5. Remove the hex nut holding the on-off-volume control.

6. Remove 1 metal screw holding the front tuner bracket.

7. Remove the rear cover.

8. Remove the picture tube socket yoke clamp, width sleeve, HV lead, antenna terminal and speaker leads. (Phono and radio leads, if so equipped.)

9. Remove metal screws from rear tuner bracket and side control panel.

10. Remove screws from top and bottom chassis brackets.

11. Remove chassis.

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably with a test pattern.

Turn the Local-Distance control fully counter clockwise.

Connect a clip lead across Horizontal Frequency coil (L17). Connect a second clip lead from pin 7 (grid) of the Horizontal Mult tube (V11) to chassis.

Set the Horizontal Hold control to the center of its range.

Adjust the Horizontal Balance control until picture synchronizes horizontally although the picture may sway from side to side.

Remove the clip lead from L17 and adjust the Horizontal Frequency slug (B1) until the picture again synchronizes horizontally.

Remove the short from the tube grid. The Local-Distance control may now be adjusted for best reception on all available channels.

SET 400 FOLDER 3

HOFFMAN MODELS B1261, U, B3331, U, B3341, U, B3374, U, K3341, U, M1261, U, M3331, U, M3341, U, M3374, U, P1261, U, P3374, U, SP3331, U, SP3341, U (Ch. 334, U)

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove 4 push-on type knobs from the front.

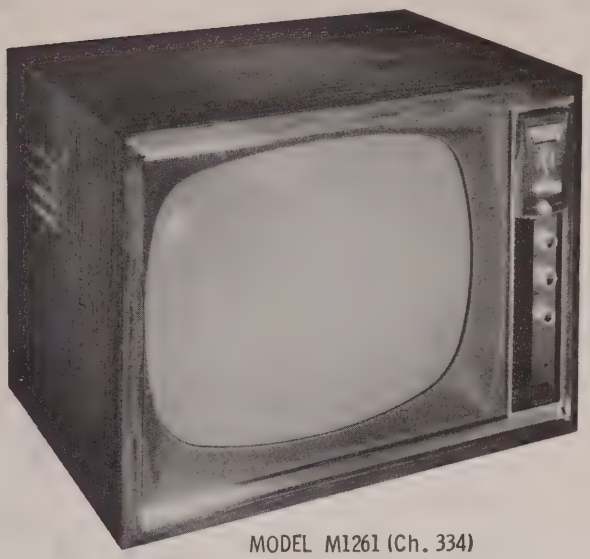
2. Remove 8 wood screws holding the rear cover. Remove the rear cover.

3. Remove the picture tube socket, HV lead, yoke plug, tuning plug, speaker leads and ground lead to picture tube mounting.

4. Remove 1 wood screw from the top chassis brace.

5. Remove 2 chassis bolts from the bottom.

6. Remove the chassis.



MODEL M1261 (Ch. 334)

HOFFMAN MODELS B1261, U, B3331, U, B3341, U, B3374, U, K3341, U, M1261, U, M3331, U, M3341, U, M3374, U, P1261, U, P3374, U, SP3331, U, SP3341, U (Ch. 334, U)

TRADE NAME	Hoffman	MODELS	CHASSIS
		B1261, B3331, B3341, B3374, K3341, M1261, M3331, M3341, M3374, P1261, P3374, SP3331, SP3341, X3341	334
		B1261U, B3331U, B3341U, B3374U, K3341U, M1261U, M3331U, M3341U, M3374U, P1261U, P3374U, SP3331U, SP3341U, X3341U	334U
		Remote Unit	RP-409
MANUFACTURER	Hoffman Radio Corp., 6200 S. Avalon Blvd., Los Angeles 3, Calif.		
TYPE SET	Television Receiver		
TUBES	Nineteen		
POWER SUPPLY	110-120 Volts AC, 60 Cycle	RATING	190 Watts, 1.8 Amp. @ 117 Volts AC 220 Watts, 2.2 Amp. @ 117 Volts AC (Tuning)
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)		

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustment of the VHF oscillator is possible by raising the trap door above the fine tuning knob. Set the fine tuning at the center of its range. The adjustments are accessible, one at a time, as the channel selector is rotated. Adjust for best picture and sound.

PICTURE TUBE SAFETY GLASS CLEANING

Remove 4 wood screws from the trim strip at the top edge of the safety glass. Tilt glass out at the top and lift up to remove.

SPECIAL ADJUSTMENTS

A. AGC
Observe the picture and advance the AGC control to a point where the picture distorts or a buzz is heard in the sound. Back off from this setting until the picture becomes stable with no noise in the sound.

B. Automatic Tuning Adjustments
Turn the receiver on and press the left hand tuning push-button. This turns the preselector system off and switches the tuning mechanism over to standard pusbutton power tuning.
Hold the right hand button in until the tuner advances to an unused channel .
Turn the receiver off and open the trap door located above the fine tuning control.

Push in on the activating pins beside each channel to be received and pull out on the others. NOTE: Always be sure that the tuner is set to an unused channel because pushing in on the top center activating pin may result in damage to the mechanism.

C. Focus
The focus may be varied by the position of a strap on the base of the picture tube. The strap can be connected between pins 6 and 2 or 6 and 10.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENTS

The horizontal frequency coil is used as the horizontal hold control. Adjust the horizontal hold until the picture synchronizes horizontally. (For location, see tube placement chart.)

SOUND IF DETECTOR BUZZ ADJUSTMENT

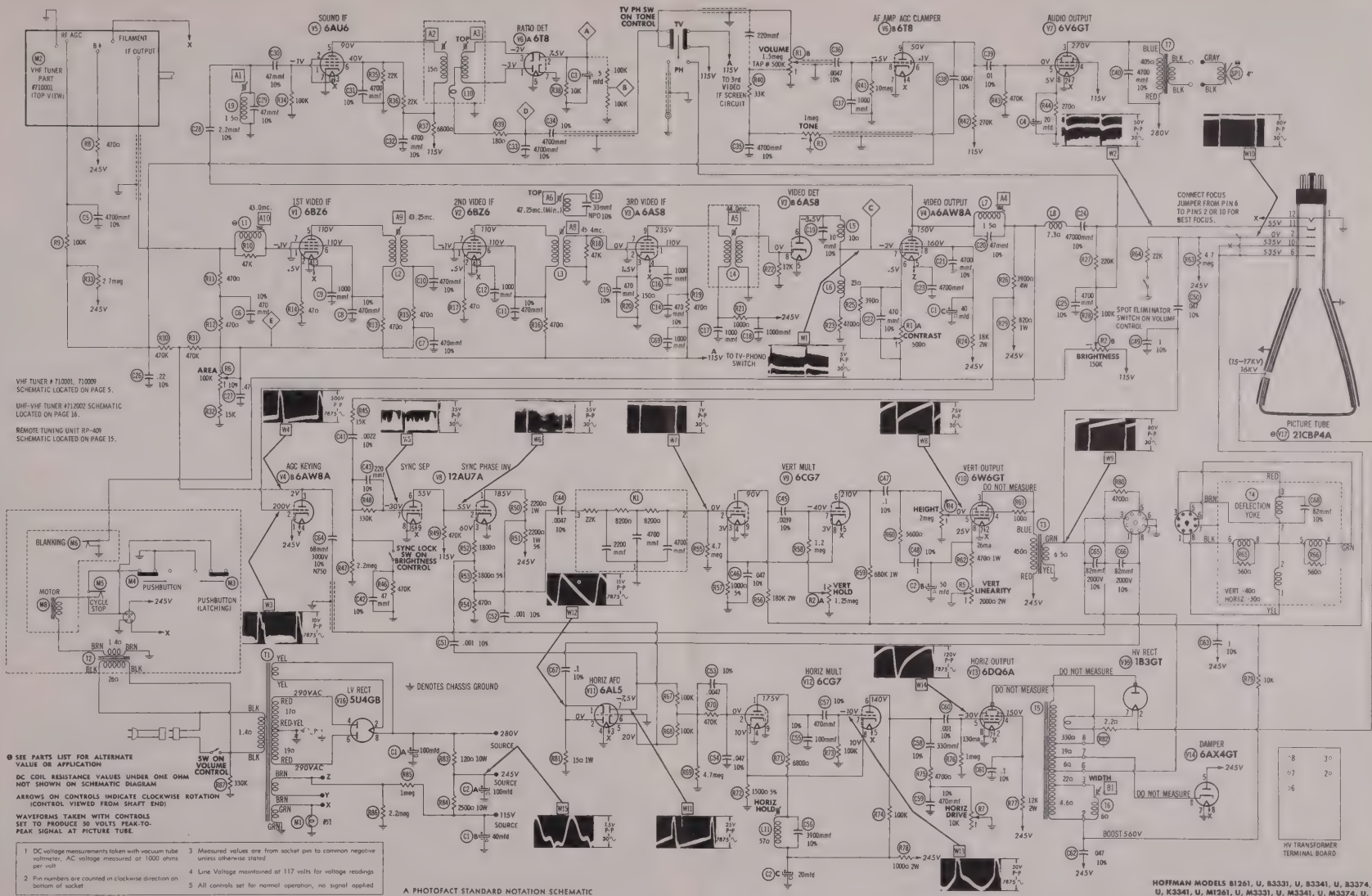
To eliminate sound IF detector buzz, adjust the ratio detector secondary (A3) located on top of chassis.

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube. Rotate the two rings around the neck of the tube until the picture is properly centered.

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

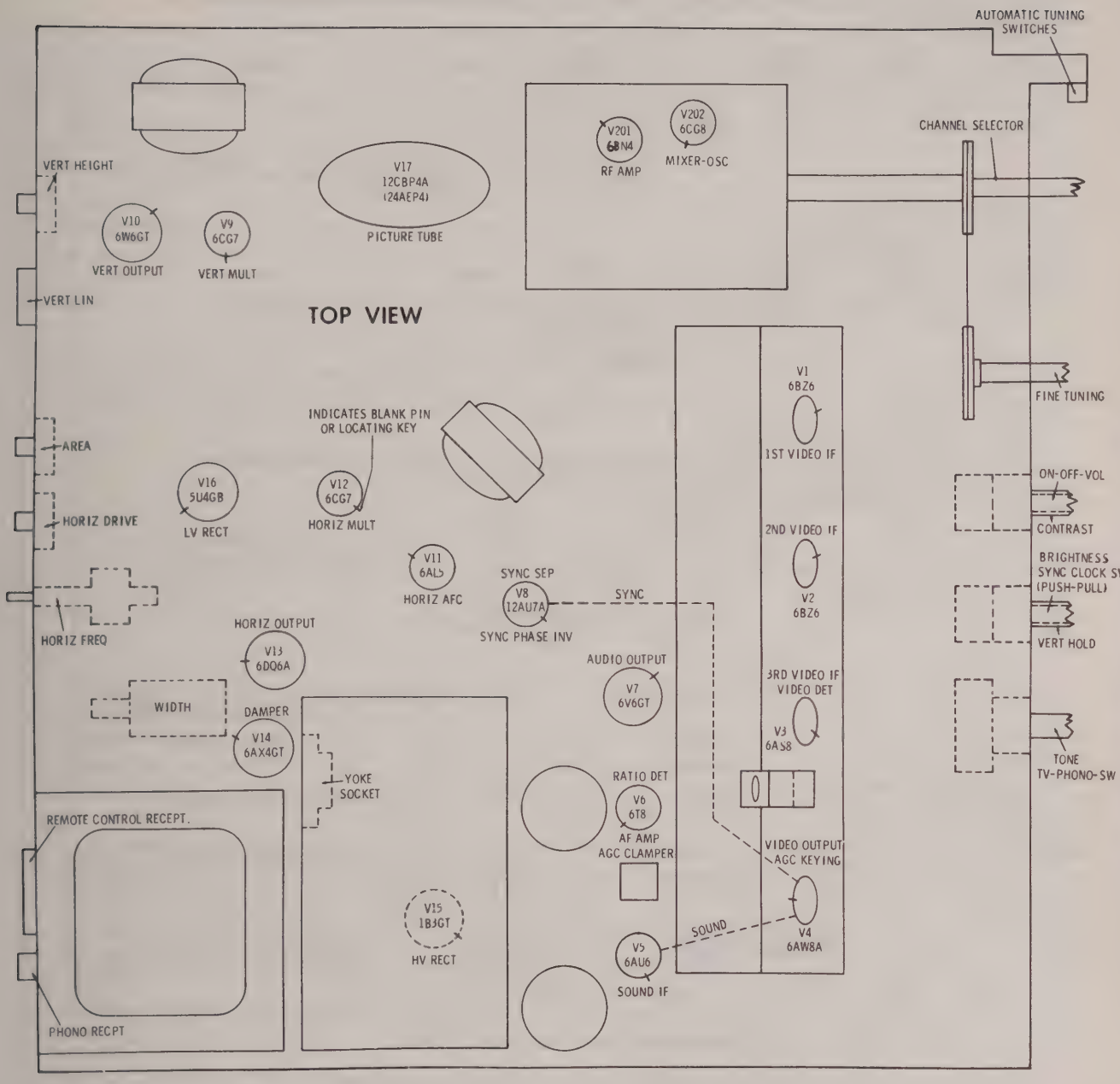
The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1958 Howard W. Sams & Co., Inc., Indianapolis 5, Indiana . Printed in U.S. of America


SOUND IF V5 6AU6
RATIO DET V6A 6T8
TV PH SW ON TONE CONTROL
AF AMP AGC CLAMPER V6B 6T8
AUDIO OUTPUT V7 6V6GT
1ST VIDEO IF V1 6BZ6
2ND VIDEO IF V2 6BZ6
3RD VIDEO IF V3A 6AS8
VIDEO DET V3B 6AS8
VIDEO OUTPUT V4 6AW8A
AGC KEYING V4B 6AW8A
SYNC SEP V8 12AU7A
SYNC PHASE INV.
VERT MULT V9 6CG7
VERT OUTPUT V10 6W6GT
HORIZ AFC V11 6AL5
HORIZ MULT V12 6CG7
HORIZ OUTPUT V13 6DQ6A
HV RECT V2B 1B3GT
LV RECT V16 5U4GB
DAMPER V14 6AX4GT
PICTURE TUBE V17 21CBP4A
VHF TUNER PART #710001 (TOP VIEW)
VHF TUNER # 710001, 710009 SCHEMATIC LOCATED ON PAGE 5.
UHF-VHF TUNER #712002 SCHEMATIC LOCATED ON PAGE 18.
REMOTE TUNING UNIT RP-409 SCHEMATIC LOCATED ON PAGE 15.
DENOTES CHASSIS GROUND
SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM
ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)
WAVEFORMS TAKEN WITH CONTROLS SET TO PRODUCE 50 VOLTS PEAK-TO-PEAK SIGNAL AT PICTURE TUBE.
1 DC voltage measurements taken with vacuum tube voltmeter, AC voltage measured at 1000 ohms per volt
2 Pin numbers are counted in clockwise direction on bottom of socket
3 Measured values are from socket pin to common negative unless otherwise stated
4 Line Voltage maintained at 117 volts for voltage readings
5 All controls set for normal operation, no signal applied
A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1958
HOFFMAN MODELS B1261, U, B3331, U, B3341, U, B3374, U, K3341, U, M1261, U, M3331, U, M3341, U, M3374, U, P1261, U, P3374, U, SP3331, U, SP3341, U (Ch. 334, U)

HOFFMAN MODELS B1261, U, B3331, U, B3341, U, B3374, U, K3341, U, M1261, U, M3331, U, M3341, U, M3374, U, P1261, U, P3374, U, SP3331, U, SP3341, U (Ch. 334, U)

FOLDER 3

TUBE PLACEMENT CHART



HOFFMAN MODELS B1261, U, B3331, U, B3341, U, B3374, U, K3341, U, M1261, U, M3331, U, M3341, U, M3374, U, P1261, U, P3374, U, SP3331, U, SP3341, U (Ch. 334, U)

TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound V16 (Some versions may use 3/4A fuse).

SWEEP FAILURE
No raster, has sound V11, V12, V13, V14, V15, V17
No vertical deflection V9, V10
Poor vert. linearity or foldover V9, V10
Poor horiz. linearity or foldover V12, V13, V14
Narrow picture V12, V13, V14, V16
Vert. off freq. V9
Horiz. off freq. V12

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster V1, V2, V3, V4
No pic, no sound, has snow V201, V202, V1
No pic, has sound, has raster V4, V17
Has pic, no sound V5, V6, V7
Overloaded picture V4

SYNC FAILURE
No vert. sync V8
No horiz. sync V8, V11
No vert. or horiz. sync V8

ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

The high voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.
Connect the negative lead of a 60 volt bias supply to pin 5 (grid) of the horizontal output tube (V15). Positive to chassis.

SOUND IF ALIGNMENT

Connect two matched 100K (±1%) resistors in series from point Ⓐ to chassis. The junction of these two resistors is alignment point Ⓑ as shown on the schematic.
Set the contrast control fully clockwise.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	.005mfd	High side to point Ⓒ. Low side to chassis.	4.5MC (Unmod)	Any non-interfering channel	DC probe thru 10K to point Ⓐ. Common to chassis.	A1, A2	Adjust for maximum deflection.
2.	"	"	"	"	DC probe thru 10K to point Ⓑ. Common to Ⓓ.	A3	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

4.5MC TRAP ALIGNMENT

Set the contrast control fully clockwise.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
3.	.05mfd	High side to point Ⓒ. Low side to chassis.	4.5MC (Unmod)	Any non-interfering channel	DC probe thru detector network (Fig. 1) to pin 11 (cathode) of picture tube. Common to chassis.	A4	Adjust for MINIMUM deflection.

VIDEO IF ALIGNMENT

Connect the negative lead of a 3 volt bias supply to point Ⓔ. Positive to chassis.
Turn the contrast control fully counter clockwise.
Connect a 1000mmf capacitor across the VTVM and the scope.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough generator output to provide a usable indication on VTVM.
Use only enough sweep generator output to provide a usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
4.	Direct	High side to ungrounded tube shield floating over mixer-osc. tube (V202). Low side to chassis.	Not used	44.0MC (Unmod)	Any non-interfering channel	USE VTVM. DC probe thru 10K to point Ⓒ. Low side to chassis. (Across video det. load).	A5	Adjust for maximum deflection.
5.	"	"	"	47.25MC	"	"	A6, A7	Adjust for MINIMUM deflection. NOTE: A7 used only in chassis coded "AJ".
6.	"	"	"	45.4MC	"	"	A8	Adjust for maximum deflection.
7.	"	"	"	43.25MC	"	"	A9	"
8.	"	"	"	43.0MC	"	"	Mixer Plate Coil	Adjust for MINIMUM deflection.
9.	"	"	"	43.0MC	"	"	A10	Adjust for maximum deflection.
10.	"	"	"	45.0MC	"	"	Mixer Plate Coil	"
11.	"	"	44.0MC (10MC Swp)	42.25MC 45.0MC 45.75MC	"	Vert. Amp. thru 10K to point Ⓒ. Low side to chassis. (across video det. load)		Check for response similar to Fig. 2. If necessary, retouch A5, A8 and A9 for desired response.

TUNER ALIGNMENT INSTRUCTIONS LOCATED ON PAGE 6.

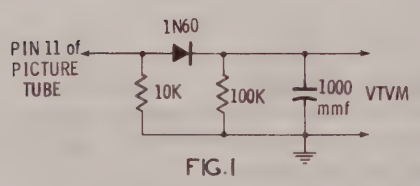


FIG. 1

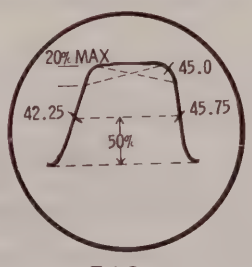
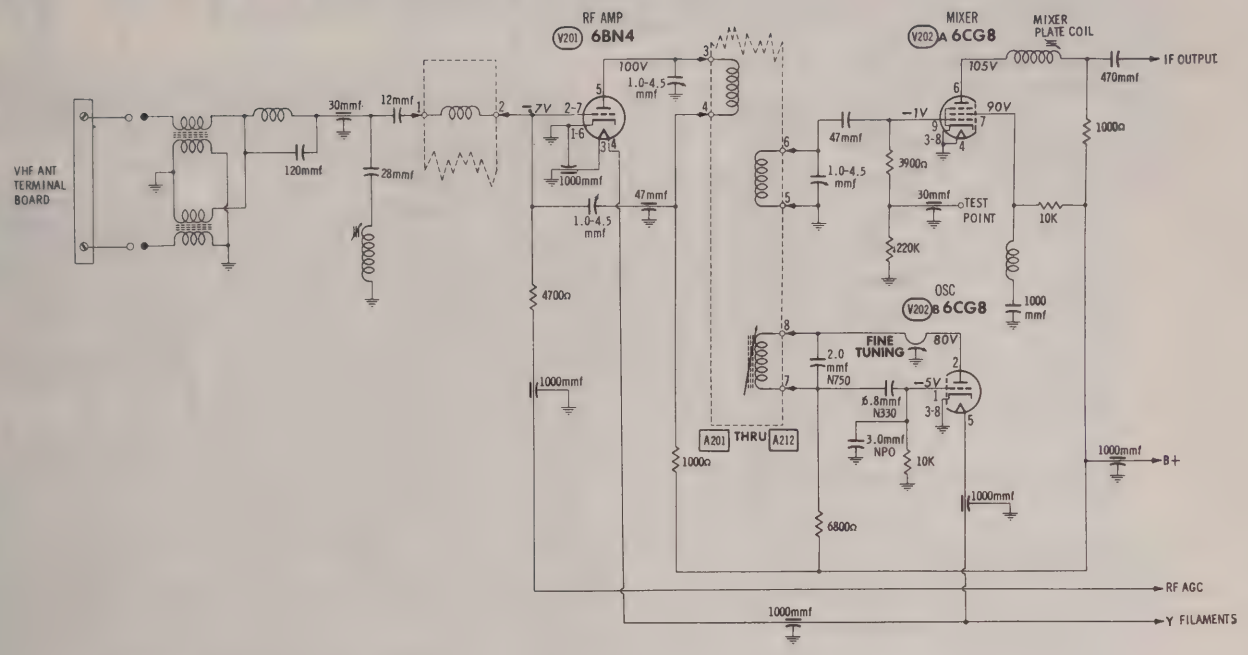
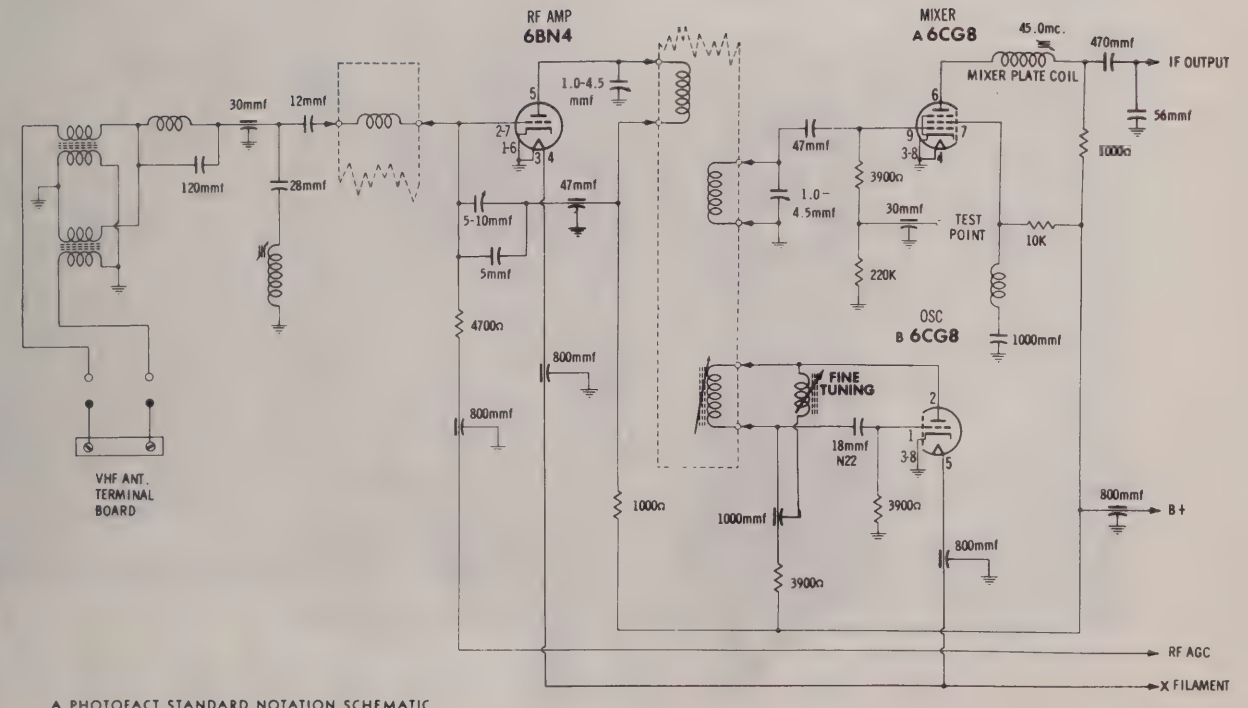


FIG. 2



A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1958

TUNER #710001, 710003



A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1958

TUNER #710009, 710010

TUNER ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

The High Voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.

VHF OSCILLIATOR ALIGNMENT

Connect variable bias to IF AGC line. Adjust bias to obtain response curve which shows no indication of overloading.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning to the center of its range.
Use only enough sweep generator output to provide a usable pattern on scope.
Use 10MC sweep unless otherwise noted.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC	211.25MC 215.75MC	13	Vert. amp. thru 47K across video detector load.	A201	Adjust to place sound marker in trap notch as in Fig. 201. Video marker should fall at 50%.
			207MC	205.25MC 209.75MC	12		A202	
			201MC	199.25MC 203.75MC	11		A203	
			195MC	193.25MC 197.75MC	10		A204	
			189MC	187.25MC 191.75MC	9		A205	
			183MC	181.25MC 185.75MC	8		A206	
			177MC	175.25MC 179.75MC	7		A207	
			85MC	83.25MC 87.75MC	6		A208	
			79MC	77.25MC 81.75MC	5		A209	
			69MC	67.25MC 71.75MC	4		A210	
			63. MC	61.25MC 65.75MC	3		A211	
			57MC	55.25MC 59.75MC	2		A212	

VHF RF AND MIXER ALIGNMENT

This portion of the receiver has been properly aligned at the factory and is very stable. Alignment of this portion should not be required in the field.

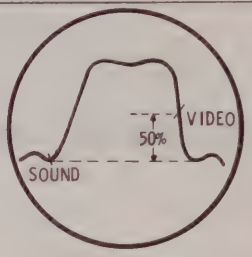
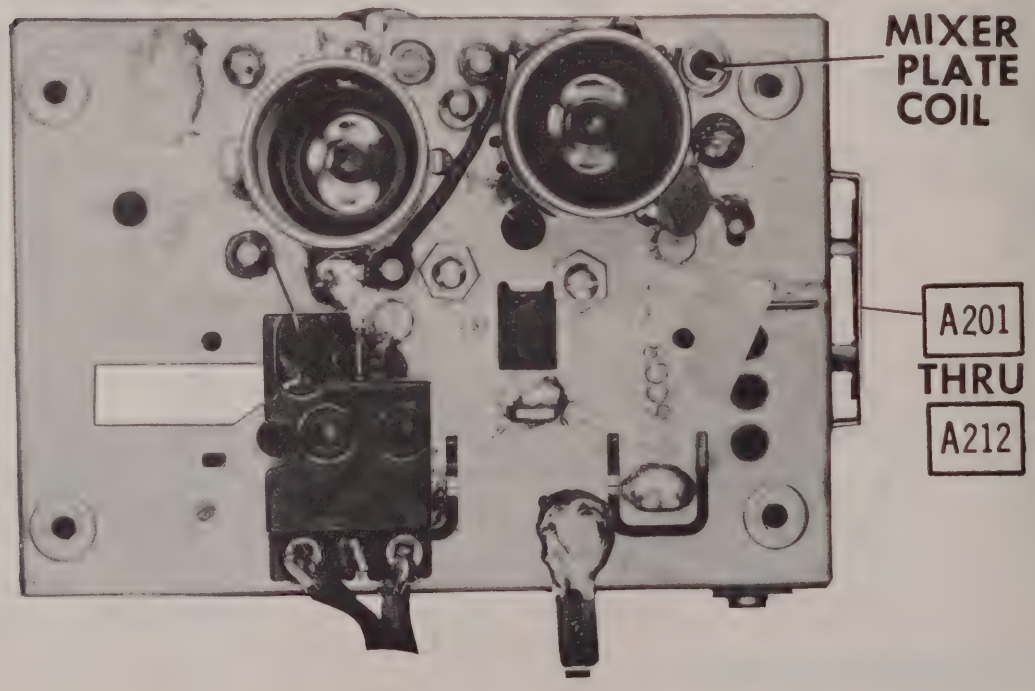
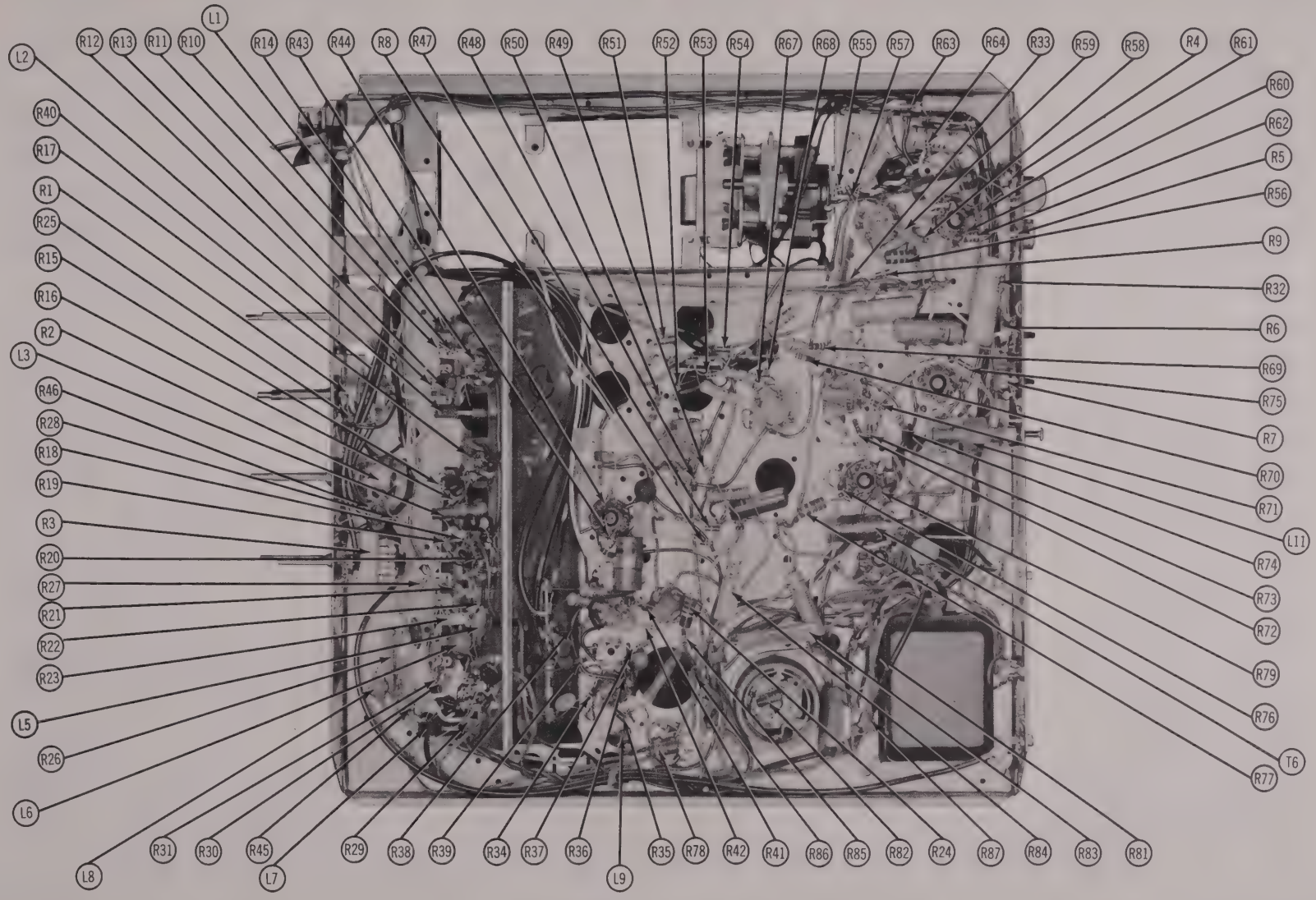


FIG. 201

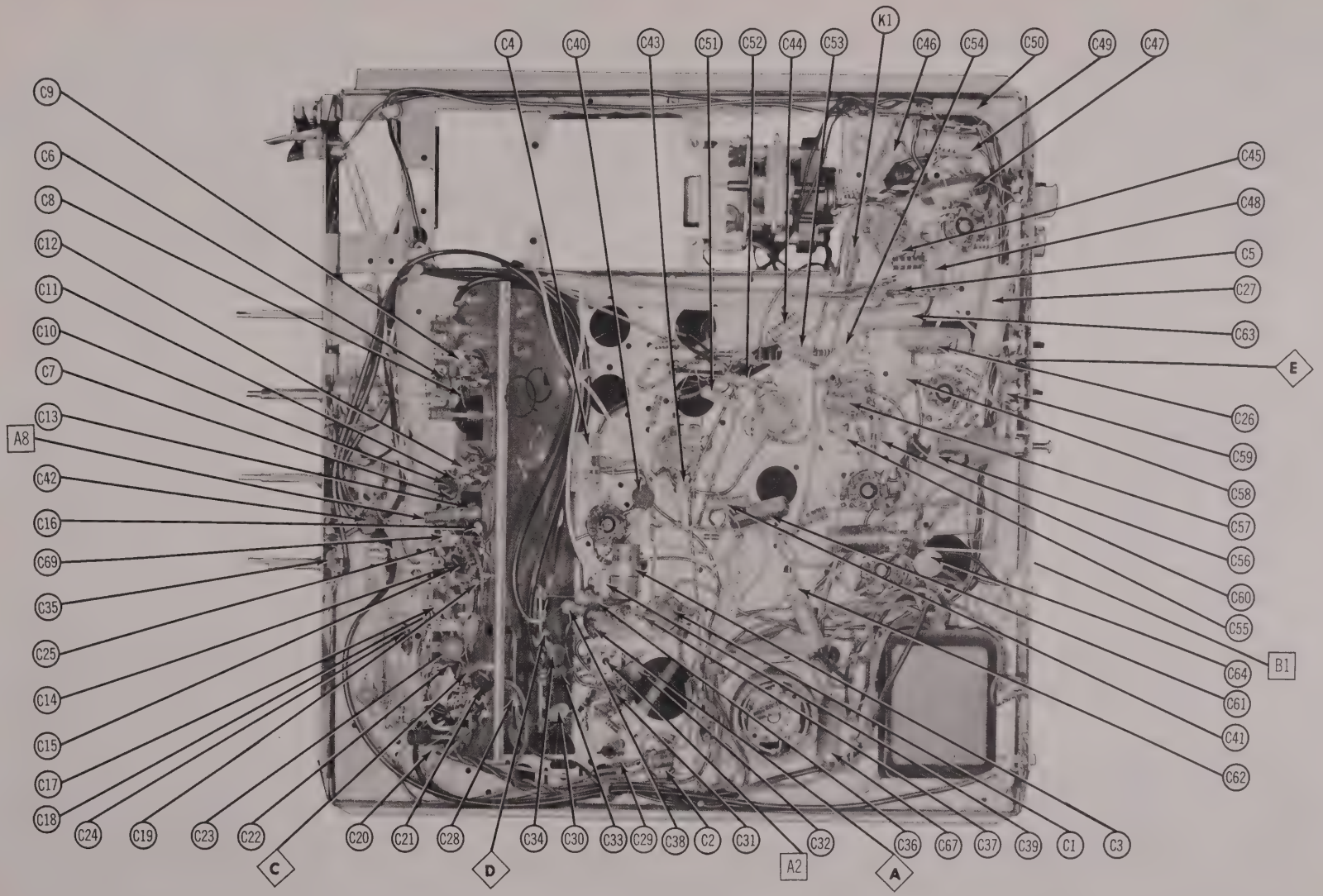


TUNER TOP VIEW

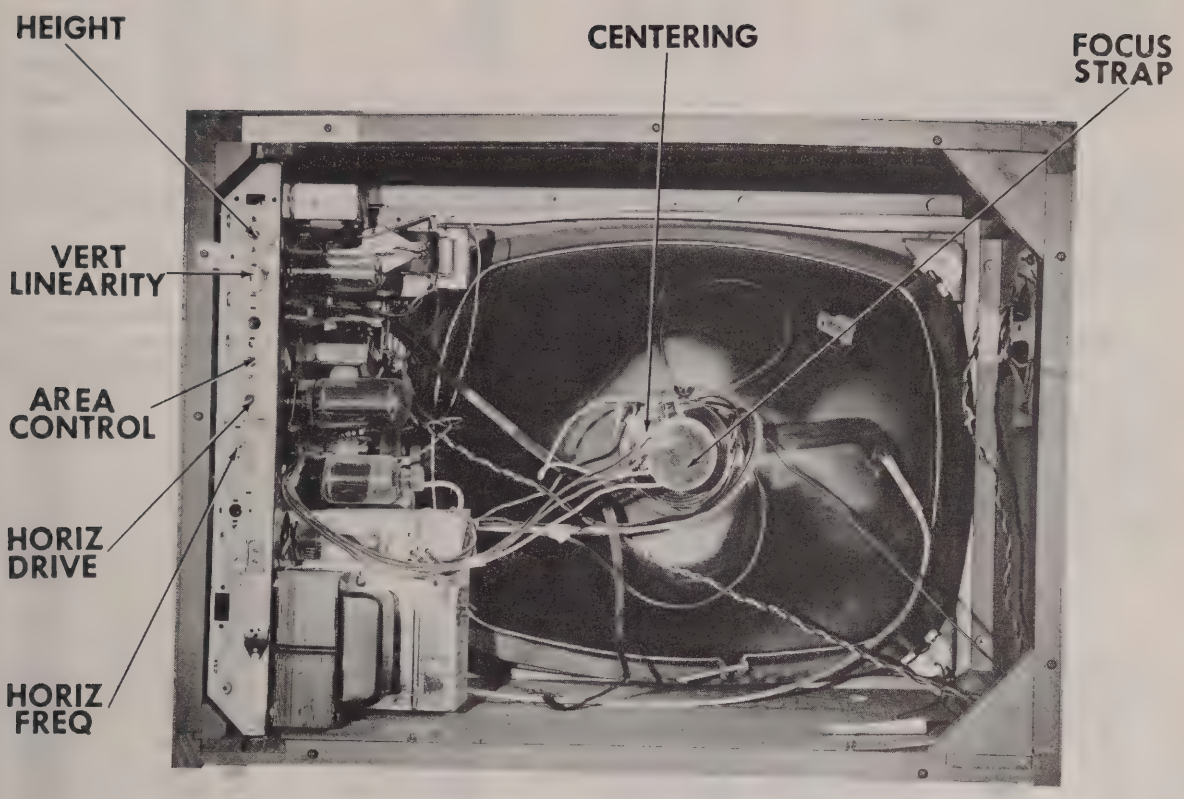


HOFFMAN MODELS B1261, U, B3331, U, B3341, U, B3374, U, K3341, U, M1261, U, M3331, U, M3341, U, M3374, U, P1261, U, P3374, U, SP3331, U, SP3341, U (Ch. 334, U)

FOLDER 3



CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

1. Turn the set on and tune in a TV station, preferably with a test pattern.

2. Set the brightness and contrast controls for a normal picture.

3. Turn the horizontal hold clockwise until the picture loses sync. It may be necessary to switch off channel and back again for picture to lose sync.

4. Turn the horizontal hold slowly counter clockwise until the picture just falls into sync.

5. Turn to an unused channel. If vertical lines appear near the center of the screen, slowly adjust the horizontal drive control (R7) until white lines disappear.

6. If in step 5 the horizontal drive was adjusted, tune in a TV station and repeat steps 3 and 4. Check horizontal sync by switching off channel and back again.

7. Adjust width slug (B1) for a picture SLIGHTLY wider than necessary to fill the mask horizontally.

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	1st. Video IF Amp.	6BZ6	
V2	2nd. Video IF Amp.	6BZ6	
V3	3rd. Video IF Amp. - Video Det.	6AS6	
V4	Video Output-AGC Keying	6AW8A	
V5	Sound IF Amp.	6AU6	
V6	Ratio Det.-AF Amp.-AGC Clamper	6T8	
V7	Audio Output	6V6GT	
V8	Sync Sep.-Sync Phase Inv.	12AU7A	
V9	Vert. Mult.	6CG7	
V10	Vert. Output	6W6GT	
V11	Horiz. AFC	6AL5	
V12	Horiz. Mult.	6CG7	
V13	Horiz. Output	6DQ6A	
V14	Damper	6AX4GT	
V15	HV Rectifier	1B3GT	
V16	LV Rectifier	5U4GA	

PICTURE TUBE

ITEM No.	REPLACEMENT DATA				NOTES
	HOFFMAN PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	SYLVANIA PART No.	
V17	21CBP4A		21CBP4A ①	21CBP4/ 21CBP4A ②	① "Silverama" ② ② "Silver Screen 85"
	34AEP4		34AEP4 ①	34AEP4 ④	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	HOFFMAN PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	±100	350	856904	AFH4-58-75	B3453 BR4035	FP327.87		Q-421.5	*R2419
B	±40	250							
C	±40	300							
C2A	±100	350	856903	AFH4-56-65	C0230 BR505	FP330.22	TMD-102 TD-20-350	T-110 MT-0550	*R2403
B	±50	50							
C	±20	350							
C3	5	50	856006	PR50V5	BBR5-50	TC30	TD-5-50	MT-0504	TVA-1303
C4	20	50	856006	PR50V20	BBR25-50	TC45	TD-25-50	MT-1520	TVA-1306

* Non-catalog item.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	HOFFMAN PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C5	4700		856359			1R5D47			MS-245	10%
C6	470		851123		D6-471	5RS7T47	ED-470		MS-347	10%
C7	470		851123		D6-471	5RS7T47	ED-470		MS-347	10%
C8	470		851123		D6-471	5RS7T47	ED-470		MS-347	10%
C9	1000		850306	BPD-001	DD-102	BYA5D1	ED-1000	DC521	5HK-DI	
C10	470		851123		D6-471	5RS7T47	ED-470		MS-347	10%
C11	470		851123		D6-471	5RS7T47	ED-470		MS-347	10%
C12	1000		850306	BPD-001	DD-102	BYA5D1	ED-1000	DC521	5HK-DI	
C13	33			NPO-DI 33	DTZ-33 C10G33C	TCO-33	ED-33	ZT-5533	STCC-Q33	NPO 10%
C14	470		851123		D6-471	5RS7T47	ED-470		MS-347	10%
C15	470		851123		D6-471	5RS7T47	ED-470		MS-347	10%
C16	1000		850306	BPD-001	DD-102	BYA5D1	ED-1000	DC521	5HK-DI	
C17	1000		850306	BPD-001	DD-102	BYA5D1	ED-1000	DC521	5HK-DI	
C18	1000		850306	BPD-001	DD-102	BYA5D1	ED-1000	DC521	5HK-DI	
C19	10		854043	NPO-SI 10	D6-100	L10Q3	GP-10	ZT-541	STCC-Q1	10%
C20	47		854051	NPO-DI 47	DD-470	L10Q47	ED-47	ZT-5447	STCC-Q47	10%
C21	4700		856359			1R5D47			MS-247	10%
C22	470		849501		D6-471	5RS7T47	ED-470		MS-347	10%
C23	4700		851004			1R5D47			MS-247	
C24	47000		856371							10%
C25	4700		856359			1R5D47			MS-247	10%
C26	.22	200	856179					GEM-2023		10%
C27	.47	600	856353					GEM-6047		10%
C28	2.2		854035		TCZ-2R2		TCO-2.2			10%
C29	47		854051	NPO-DI 47	DD-470	L10Q47	ED-47		STCC-Q47	10%
C30	47		854051	NPO-DI 47	DD-470	L10Q47	ED-47		STCC-Q47	10%
C31	4700		856359			1R5D47			MS-247	10%
C32	4700		856359			1R5D47			MS-247	10%
C33	4700		856359			1R5D47			MS-247	10%
C34	4700		856359			1R5D47			MS-247	10%
C35	4700		856359			1R5D47			MS-247	10%
C36	.0047	200	856159					GEM-16247		10%
C37	1000		850306	BPD-001	DD-102	BYA5D1	ED-1000	DC521	5HK-DI	
C38	.0047	200	856159					GEM-16247		10%
C39	.01	200	856163					GEM-1611		10%
C40	4700		856359			1R5D47			MS-247	10%
C41	.0022	400	856255					GEM-16222		10%
C42	47		854051	NPO-DI 47	DD-470	L10Q47	ED-47		MS-447	10%
C43	220		850209		D6-221	L10T22	ED-220		MS-322	10%
C44	.0047	200	856159					GEM-16247		10%
C45	.0035	400	856255							10%
C46	.047	200	856171							10%
C47	.1	200	856175					GEM-201		10%
C48	.1	200	856175					GEM-201		10%
C49	.1	400	856175					GEM-401		10%
C50	.047	200	856171							10%
C51	.001	600	856151					GEM-1621		10%
C52	.001	200	856151					GEM-1621		10%
C53	.0047	200	856159					GEM-16247		10%
C54	.047	200	856171							10%
C55	100		854065	1469-0001	D6-101	5RS7T1	ED-100	MCB231	MS-31	10%
C56	3900		862102	1464-0039		1R5D39			MS-239	10%
C57	470		851123	1469-00047	D6-471	5RS7T47	ED-470		MS-347	10%
C58	330		850307	1469-00033	D6-331	5RS7T33	ED-330		MS-333	10%
C59	470		851122		D6-471	5RS7T47	ED-470		MS-347	
C60	.001	600	856151					GEM-1621		10%
C61	.1	400	856175					GEM-401		10%
C62	.047	600	856171							10%
C63	.1	200	856175					GEM-601		10%
C64	62	3000	856102							N750 10%
C65	62	2000	856103							10%
C66	62	2000	856103							10%
C67	.1	600	856175					GEM-601		10%
C68	82				D6-820	L10Q82	GP-82		MS-482	10%
C69	1000		850306	BPD-001	DD-102	BYA5D1	ED-1000	DC521	5HK-DI	

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA HOFFMAN PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500Ω	½	802090		RTV-652 Not Req. Not Req.	* GJ-1080	** UE3G2G	Contrast Volume - Tap ⑧ 800K
B	1.5meg	½						
C	Switch							
R2A	1.25meg	½	803023					Vert. Hold Brightness Sync Tone
B	150K	½						
C	Switch							
R3A	1meg	½	800030					TV-Phono
B	Switch							Height
R4A	2meg	½	800013	BX-78 Not Req.	A47-2meg-S FXS-1/4	Bil-119 SK3	PTA26L Not Req.	
B	Shaft				39-3000		FL-2.5K	Vert. Linearity
R5	2000Ω	2(WW)	806002	AB-40	A47-100K-S	Bil-128	FTA18L	Area
R6A	100K	½	800031	AK-1	FXS-1/4	SK3	Not Req.	
B	Shaft			AB-14	A47-10K-S	Bil-116	TA14L	Horiz. Drive
R7A	10K	½	800009	AK-1	FXS-1/4	SK3	Not Req.	
B	Shaft							

* "Concentrikit" Equivalent: K-6 Kit, Base Elements & Shafts Bil-103, P17-126 (Panel) Bil3-139X, Ri-305 (Rear) 76-3 (Switch)

** "BTA-LOC" Equivalent: FA53L, OF1875, RU5ET55, RU2187, US-43.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	HOFFMAN PART No.	NOTES
R8	470Ω		814188	
R9	100K		814216	
R10	47K		814213	
R11	470Ω		814188	
R12	470Ω		814188	
R13	470Ω		814188	
R14	47Ω		814176	
R15	470Ω		814188	
R16	470Ω		814188	
R17	47Ω		814176	
R18	47K		814213	
R19	470Ω		814188	
R20	150Ω		814182	
R21	1000Ω		814192	
R22	12K		814205	
R23	4700Ω		814200	
R24	18K	2	812307	
R25	390Ω		814167	
R26	3900Ω	4	815492	
R27	220K		814220	
R28	100K		814216	
R29	820Ω	1	814186	
R30	470K		814224	
R31	470K		814224	
R32	15K		814206	
R33	2.7meg		814233	
R34	100K		814216	
R35	22K		814208	
R36	22K		814208	
R37	6800Ω		814202	
R38	10K		814204	
R39	180Ω		814183	
R40	33K		814210	
R41	10meg		814240	
R42	270K		814221	
R43	470K		814224	
R44	2700		814185	
R45	15K		814206	
R46	470K		814224	
R47	2.2meg		814232	
R48	330K		814222	
R49	470K		814224	
R50	2200Ω	1	816203	
R51	2200Ω 5%	1	816071	
R52	1800Ω		814195	
R53	1800Ω 5%		814059	
R54	470Ω		814188	
R55	4.7meg		814236	
R56	180K	2	814219	
R57	1000Ω 5%		814068	
R58	1.2meg		814230	
R59	680K	1	814233	
R60	5600Ω		814201	
R61	100Ω		814700	
R62	470Ω	1	816195	
R63	4.7meg		814236	
R64	22K		814208	
R65	560Ω		814189	
R66	560Ω		814189	
R67	100K		814216	
R68	100K		814216	
R69	4.7meg		814236	
R70	470K		814224	
R71	6800Ω		814202	
R72	1500Ω 5%		814067	
R73	100K		814216	
R74	100K		814216	
R75	2200Ω		814200	
R76	1meg		814228	
R77	12K	2	814205	
R78	1000Ω	2	814192	
R79	10K		814204	
R80	4700Ω		814200	
R81	150	1	816177	
R82	2.2Ω		814065	
R83	120Ω	10	815181	
R84	3500Ω	10	815144	
R85	1meg		814228	
R86	2.2meg		814232	
R87	330K		814222	

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	REPLACEMENT DATA HOFFMAN PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117VAC ⑤1.6A	580VCT ⑤.280A	5VAC ⑤ 3A	716004		P-3055 ①		P-8335	26R92 ①	
	SEC. 3	SEC. 4	SEC. 5							
	6.3VAC ⑤.6A	6.3VAC ⑤0.2A								

① Tape 6.3V ⑤ 4.5A filament winding.

TRANSFORMER (REMOTE CONTROL)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	REPLACEMENT DATA HOFFMAN PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T2	117VAC ⑤.5A	27VAC ⑤1.6A		722001						

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA HOFFMAN PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T3	Vert. Output	728002	21900 ①	A-2823	V-307	A-8142 ③	26S77	A-108X	
T4A	Yoke-Horiz.(20MH)	790002	D78GT	MDF-92	Y90F19/43	DY-16A	Y-16	Y-41 &	
B	(90°)-Vert.(39MH)		③④	③④	③④	③④	③④	NW4 ③	
M7	Rear Cover & Centering Device	984002							
T5	Horiz. Output	782002	FB419 *	HVO-36 *	X094 *	HO-285 *	FLY-16 *	D-95 *	
T6	Width Coil(3-17MH)	778002	RF800 ③⑥	MWC-11	201R16	WC-18	WC-18 ⑤	WLC-6	

① Use 8 to 1 turns ratio.
④ Drill new mounting hole(s).
③ Connect same as original. Use original rear cover and centering device.
④ Use original damping network, if necessary.
⑤ Enlarge mounting hole.
⑥ Use terminals #1 and #2.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type Is Listed

	ORIGINAL TERMINAL CONNECTIONS	Halldorson Replacement Connections	Merit Replacement Connections	Ram Replacement Connections	Stancor Replacement Connections	Thordarson Replacement Connections	Triad Replacement Connections
	8	9	9	9	8	9	8
	7	7	7	7	7	7	4
	6	5	5	5	6	5	3
	3	3	3	3	3	3	2
	2	1	1	1	2	1	1
Connect Width Coil Across	2 & 3	1 & 3	1 & 3	1 & 3	2 & 3	1 & 3	1 & 2

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA HOFFMAN PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T7	6400Ω	3-4Ω	724004	Z1113 ①	A-3020	AU-602 ①	A-3878 ①	26S48	S-5Z	① Drill new mounting hole.

SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	REPLACEMENT DATA HOFFMAN PART No.	QUAM PART No.	NOTES
SP1	4"	PM	3-4Ω	708003 ①	4A07	② Used in Models B126I, U, M136I, U, P126I, U
	3½"	PM		708009 ②		③ Used in Models B333I, U, M333I, U, SP333I, U,
	8"	PM	3-4Ω	708601 ③	8A31	B334I, U, K334I, U, M334I, U, SP334I, U, K334L, U,
	6" x 9"	PM	3-4Ω	708903 ④	6A31	B337A, U, M337A, U, P337A, U
						④ Used in Models B333I, U, M333I, U, SP333I, U, B337A, U, M337A, U, P337A, U
						⑤ Used in Models B334I, U, K334I, U, M334I, U, SP334I, K334I, U

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA HOFFMAN PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1	1st. Video IF	762006	17-4534	TV-131		VF-4	Note 1
L2	2nd. Video IF	762009	17-4522	TV-130	6218	VF-3	
L3	3rd. Video IF	762007	17-4536		6232		Includes 47.25MC Trap
L4	4th. Video IF	760004	17-5004	TV-126	6234		
L5	Series Peaking Coil	771008	19-3100	TV-161	6212	VP-3	100 Microhenries
L6	Shunt Peaking Coil	771019		TV-207	6216		820 Microhenries
L7	4.5MC Trap	762005	20-1004	TV-151	1469 *	SF-3	* Disregard tap.
L8	Series Peaking Coil	771030	19-3250	TV-186	6181	VP-6	250 Microhenries
L9	Sound IF	762005			6206		
L10	Ratio Det.	774002	17-3497	TV-115	6205	SD-4	

Note 1. Chassis Coded "AJ" have an additional 47.25MC trap included at this stage.

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA HOFFMAN PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	Thordarson PART No.	NOTES
L11	57Ω		768004	19-1576	TV-163	6210	H-102	HS-5	20.5-45 Millihenries

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	HOFFMAN PART No.	REPLACEMENT DATA	
E1	Vert. Integrator	2200mmf, 4700mmf, 4700mmf, 22K, 8200Ω, 8200Ω	986001	Aerovox Centralab Cornell-Dubilier Erie Sprague	PA-110 PC-104 1157M1 1406-01 V-1

MISCELLANEOUS

ITEM No.	PART NAME	HOFFMAN PART No.	NOTES
M1	Lamp	940181	#81
M2	Tuner	710001	VHF Ch. 334
	Tuner	710009	VHF Ch. 334 Coded C or D
	Tuner	712001	VHF-UHF Ch. 334U
M3	Switch	900002	Pushbutton (Latching)
M4	Switch	900001	Pushbutton
M5	Switch	908001	Cycle Stop
M6	Switch		Blanking
M7	Centering Device	984002	Includes yoke rear cover
M8	Motor	715001	Includes blanking switch - 24V Assy.

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Safety Glass	438005	21" Models
Safety Glass	438006	24" Models
Mask	402001	21" Models
Mask	402002	24" Models
Knob	508008	Brightness, Volume
Knob	513081	Contrast, Vert. Hold
Knob	500005	VHF Fine Tuning
Knob	480037	UHF Fine Tuning
Knob	506004	Pushbutton
Knob	500025	Tone
Knob	480020	UHF, 1st. Section
Knob	480013	UHF, 2nd. Section
Cabinet	346008	Models M126I, U
Cabinet	346009	Models B126I, U
Cabinet	346010	Models P126I, U
Cabinet	352007	Models M333I, U
Cabinet	352008	Models B333I, U

HOFFMAN MODELS B126I, U, B333I, U, B334I, U, B337A, U, K334I, U, M126I, U, M333I, U, M334I, U, M337A, U, P126I, U, P337A, U, SP333I, U, SP334I, U (Ch. 334, U)

FOLDER 3

PARTS LIST AND DESCRIPTIONS (Continued)

CABINETS & CABINET PARTS (cont)

NAME	PART NO.	DESCRIPTION
Cabinet	352009	Models SP3331, U
Cabinet	354014	Models K3341, U
Cabinet	354004	Models M3341, U
Cabinet	354005	Models B3341, U
Cabinet	354006	Models SP3341, U
Cabinet	354015	Models X3341, U
Cabinet	352017	Models M3374, U
Cabinet	352018	Models B3374, U
Cabinet	352019	Models P3374, U

WIRING DATA

High Voltage Lead	Use BELDEN No. 8869
Shielded Hook-up Wire	Use BELDEN No. 8885 (Single Conductor) 8738 (Two Conductor)
General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord (Interlock Type)	Use BELDEN No. 8874
300Ω Tuner Input Lead	Use BELDEN No. 8225
300Ω Antenna Lead-in	Use BELDEN No. 8230 or 8275
Antenna Rotor Cable	Use BELDEN No. 8464 (Flat) or 8484 (Round) - 4 Conductor 8485 (Round) - 5 Conductor 8488 (Round) - 8 Conductor

POWER TUNING OPERATION

POWER TUNING OPERATION

After the Channel Preselector has been set, program selection can be made by simple pushbutton operation. Two pushbuttons are utilized to provide a choice of automatic channel selection or press button power tuning. The button on the left is a two position pushbutton switch. When the left button is set at the inward position, the right button becomes a switch for press button power tuning. When the left button is set at the outward position, the right button provides automatic channel selection. The left button is a latching type switch. Push inward and release to return the button to the outward position.

FOR AUTOMATIC TUNING

First set the left hand pushbutton switch to its outer position. Turn the receiver on and then press the right hand button. The tuner will automatically turn to the next active channel.

FOR PRESS BUTTON POWER TUNING

First set the left hand switch button to its inward position. Turn the receiver on and then press the right hand button and hold inward until the number of your channel appears in the lighted window.

TUNING SERVICE INFORMATION

The motor assembly consists of a 24 volt AC motor, coupled to the tuner shaft through a step down transmission (gear) box. The motor is disengaged from the transmission except when the motor is energized. When current flows through the motor field coils, the rotor is pulled into position to drive the tuner. When the power is turned off, a spring returns the rotor to its idle position.

The preselector wheel has two functions in the Remote Tuning system. The channel pins are utilized to open the cycle stop switch and stop the tuner at an active channel. Secondly, the channel numbers on the wheel are projected onto the channel window by the chassis pilot lamp to provide lighted channel identification on the receiver.

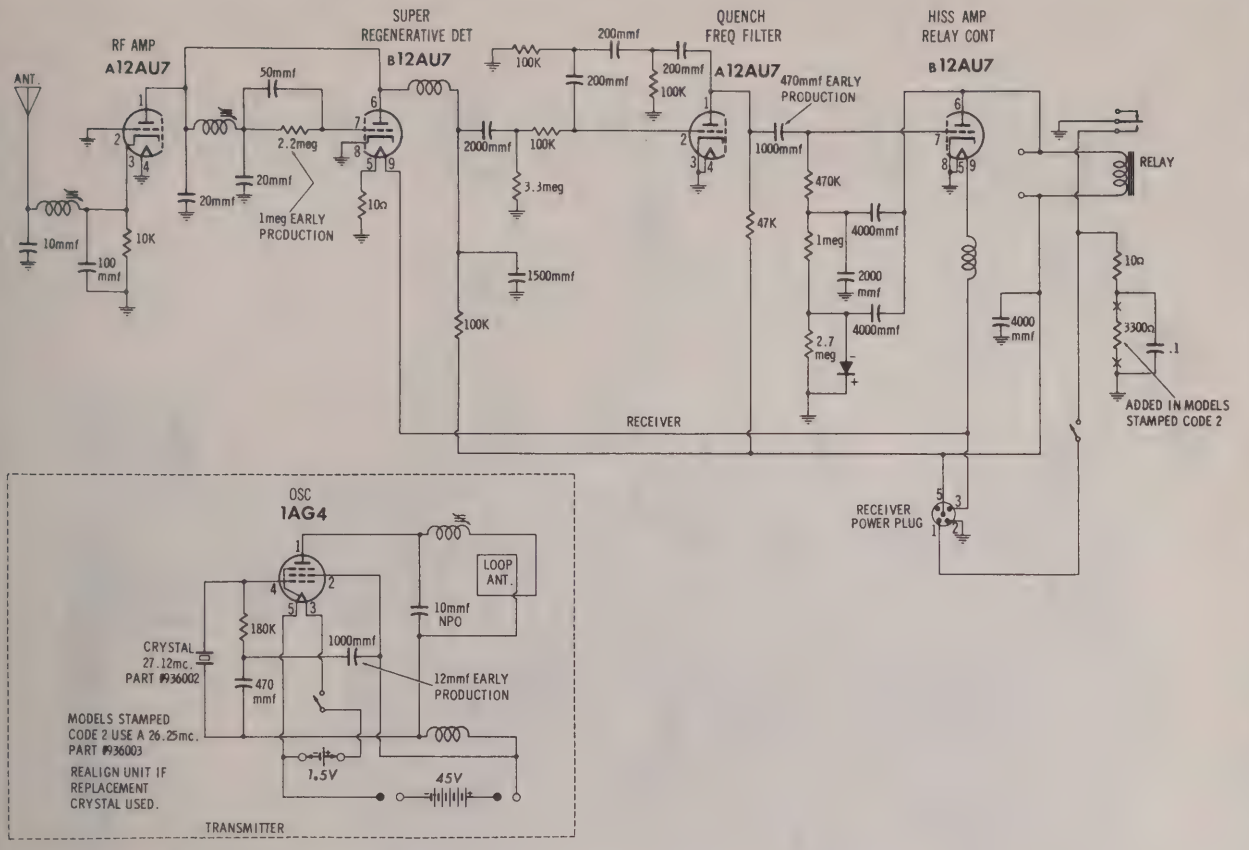
Four switches are utilized to operate the power tuning system. The blanking switch is a spring leaf type switch mounted on the rear of the motor assembly. This is utilized to turn off the picture and sound while changing channels. The switch is adjusted and installed in a manner which allows the contacts to open when the motor is operating and close when the rotor returns to the idle position. When changing channels (motor energized), it opens the cathode circuit of the video amplifier and the brightness control, cutting off both the video amplifier and the picture tube and resulting in a dark screen on the receiver. Since the sound take-off is from the video amplifier tube plate, the sound is also cut off.

The cycle stop switch is the leaf spring switch associated with the channel preselector wheel, it is adjusted and installed in a manner allowing it to be closed, except when opened by one of the active channel pins. The left hand pushbutton switch is actually an auxiliary switch and is only necessary to tune to inactive channel positions (position where channel pin is pulled outward). It is a latching type switch and may be locked in the inward (open) position or released to the normal (closed) outward position. The right hand pushbutton is used to select the channels.

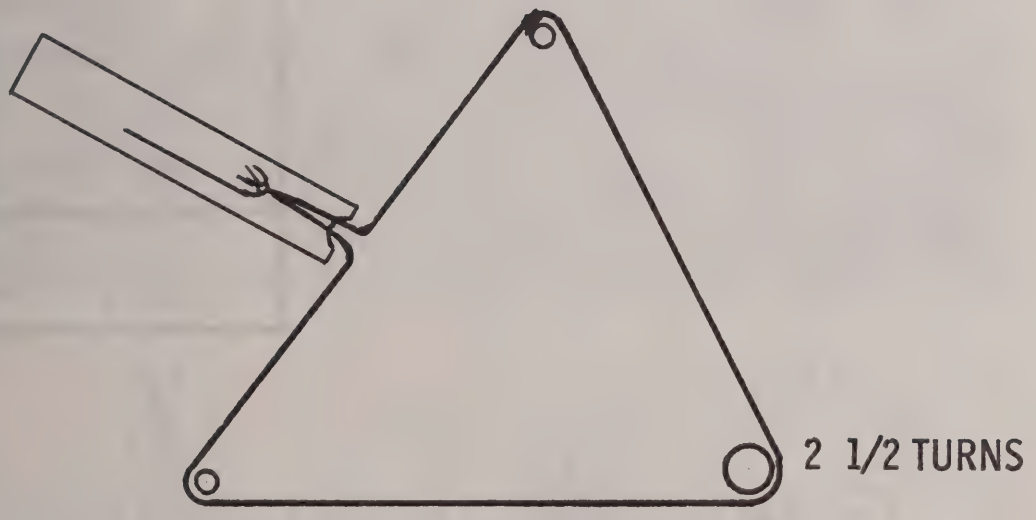
CYCLE OF OPERATION

For normal operation the left hand pushbutton will be at the outward (switch closed) position. When channel selector button (right) is pressed inward, the circuit is closed. The motor then starts to rotate and engages the drive assembly. Cycle stop switch closes as soon as the preselector wheel has turned to the point where the channel pin no longer depresses the leaf spring. When the motor starts, the blanking switch opens and kills sound and picture. With cycle stop switch closed, a holding circuit is completed and the pushbutton may now be released and the motor will continue to operate until the next active channel is reached. At this point the motor stops and the blanking switch opens to allow the picture and sound to be restored for the new channel.

With left hand pushbutton set to the inward (open) position, the cycle of operation is controlled solely by the right hand pushbutton. That is, the motor operates only as long as the right hand switch is closed. When the button is released the motor stops irregardless of the position of channel pin relative to the cycle stop switch. Through use of the left hand pushbutton it is possible to rotate the tuner to any position desired, including the inactive channel positions.



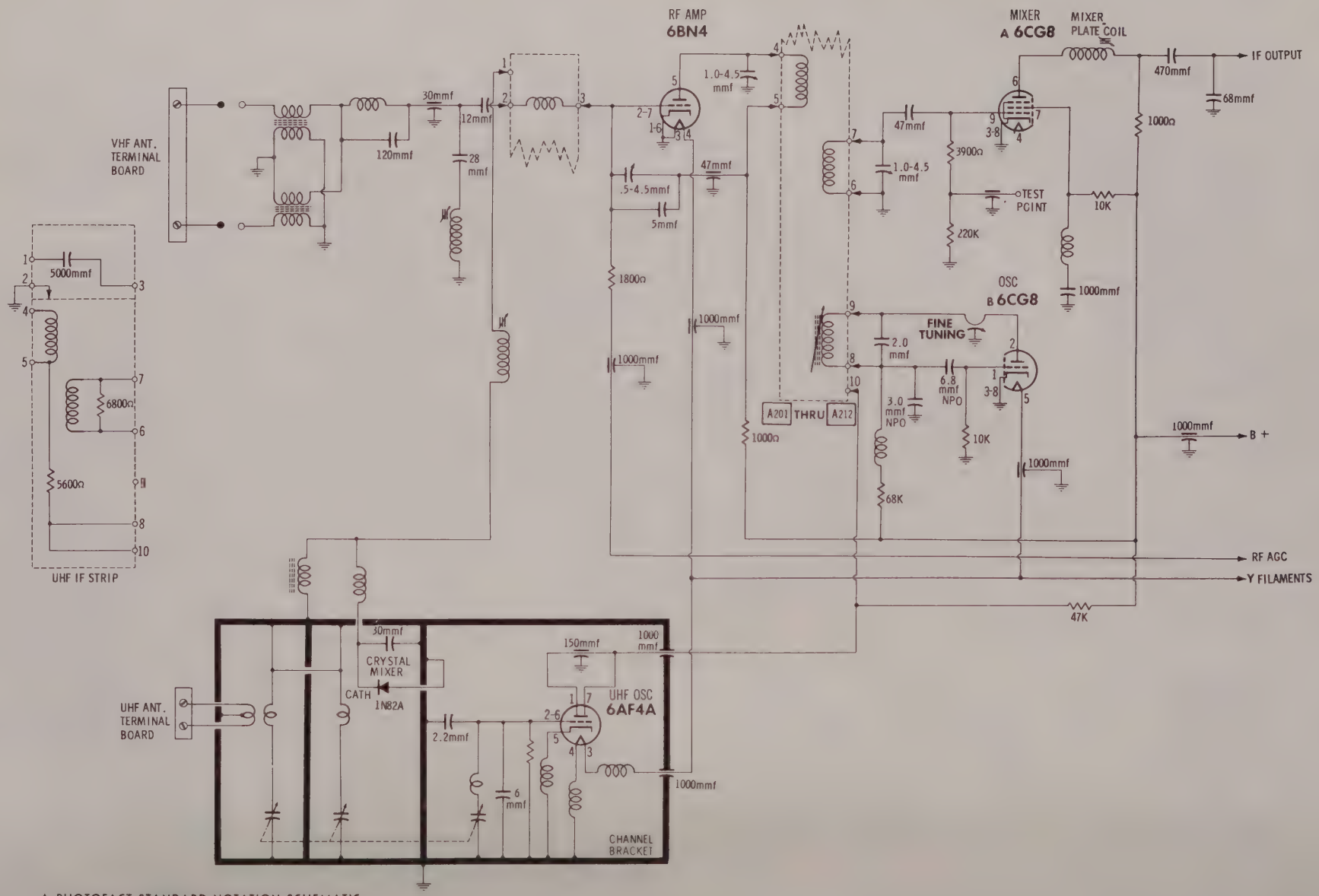
RP-409 REMOTE CONTROL UNIT



UHF DRIVE CORD

HOFFMAN MODELS B1261, U, B3331, U, B3341, U, B3374, U, K3341, U, M1261, U, M3331, U, M3341, U, M3374, U, P1261, U, P3374, U, SP3331, U, SP3341, U (Ch. 334, U)

FOLDER



A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1958

TUNER #712002

CHASSIS TOP VIEW

HOFFMAN MODELS B1261, U, B3331, U, B3341, U, B3374, U, K3341, U, M1261, U, M3331, U, M3341, U, M3374, U, P1261, U, P3374, U, SP3331, U, SP3341, U (Ch. 314, U)

RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6BZ6	18K	47Ω	.1Ω	0Ω	†3100Ω	†3100Ω	0Ω		
V2	6BZ6	18K	47Ω	.1Ω	0Ω	†3100Ω	†3100Ω	0Ω		
V3	6AS8	†3100Ω	.1Ω	150Ω	.1Ω	0Ω	4700Ω	0Ω	.1Ω	†1100Ω
V4	6AW8A	†120Ω	†900Ω	350K	650K	650K	• 30Ω	4700Ω	†18K	†5800Ω
V5	6AU6	100K	0Ω	.1Ω	0Ω	†9400Ω	†31K	0Ω		
V6	6T8	INF	10K	INF	.1Ω	0Ω	580K	0Ω	10meg	†270K
V7	6V6GT	NC	0Ω	†405Ω	†2600Ω	470K	NC	.1Ω	270Ω	
V8	12AU7A	†4500Ω	†470K	4000Ω	0Ω	0Ω	†470K	2.5meg	0Ω	.1Ω
V9	6CG7	‡190K	4.7meg	1000Ω	0Ω	.1Ω	‡690K	• 1.8meg	1000Ω	0Ω
V10	6W6GT	TP	.1Ω	†570Ω	†670Ω	• 1meg	TP	0Ω	• 900Ω	
V11	6AL5	15Ω	15Ω	.1Ω	0Ω	4.8meg	0Ω	4.8meg		
V12	6CG7	†8900Ω	5.2meg	1500Ω	0Ω	.1Ω	†100K	100K	1500Ω	0Ω
V13	6DQ6A	TP	.1Ω	NC	†12K	1meg	NC	0Ω	0Ω	TOP CAP †19Ω
V14	6AX4GT	TP	NC	INF	NC	†120Ω	NC	0Ω	.1Ω	
V15	1B3GT		PINS	1 THRU 8	HAVE	INFINITE	RESISTANCE			TOP CAP ‡349Ω
V16	5U4GB	NC	¶	NC	17Ω	TP	19Ω	TP	¶	
V17	21CBP4A	0Ω	22K	PIN 6 ‡10K	PIN 10 ‡10K	PIN 11 • 380K	PIN 12 .1Ω			
V201	6BN4	0Ω	680K	0Ω	.1Ω	†4100Ω	0Ω	680K		
V202	6CG8	10K	‡9900Ω	0Ω	0Ω	.1Ω	†4100Ω	†13K	0Ω	220K
ITEM	TUBE	Pin 1	PIN 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9

¶ THIS READING CAN VARY GREATLY, (10K MINIMUM), DUE TO THE CONDITION OF THE ELECTROLYTIC CAPACITOR CONNECTED IN THE ASSOCIATED CIRCUIT.

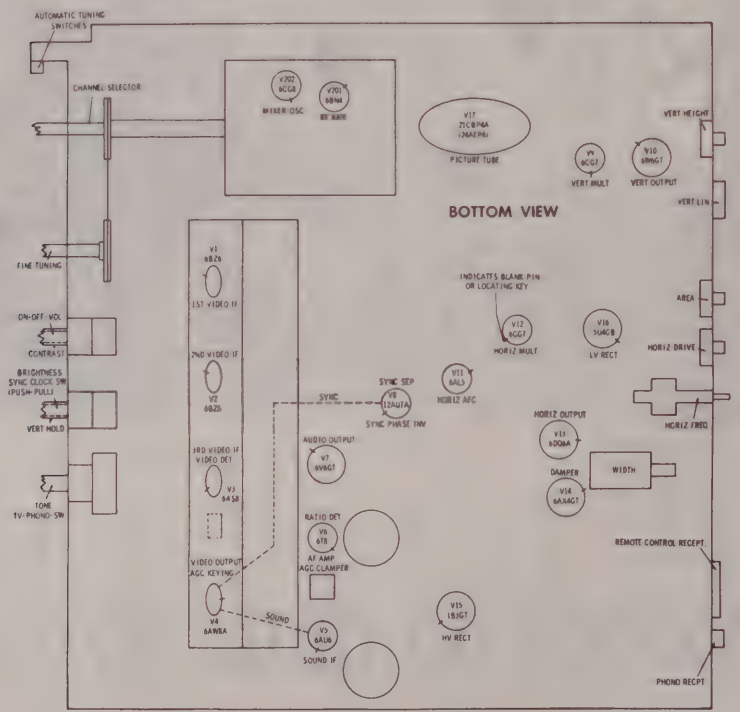
• THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.

† MEASURED FROM 280V SOURCE.

‡ MEASURED FROM PIN 3 OF V14.

NC NO CONNECTION

TP TIE POINT



TUBE PLACEMENT CHART

DISASSEMBLY INSTRUCTIONS

MODEL 21D8307 (Ch. KCS119A)

CHASSIS REMOVAL

1. Remove 8 push-on type control knobs from the side. (On Console Models from the side and top.)

2. Remove 1 metal screw and 4 spring clips holding the rear cover. Remove the rear cover.

3. Remove the speaker leads, picture tube socket, HV lead and yoke plug.

4. Remove 2 metal screws holding the top chassis braces. (Console Models 2 hex nuts)

5. On Console Models remove 1 metal screw, accessible thru a hole in the side of the cabinet, holding the volume control assembly.

6. Remove 2 chassis bolts from the bottom.

7. Remove the chassis.

TRADE NAME	RCA Victor	MODELS	CHASSIS
		21D8281, 21D8282, 21D8305, 21D8306, 21D8307	KCS116A
		21D8281U, 21D8282U, 21D8305U, 21D8306U, 21D8307U	KCS116B
		21D8628	KCS116C
		21D8628U	KCS116D
MANUFACTURER	Radio Corporation of America, RCA Victor Tele. Div., Camden 8, N.J.		
TYPE SET	Television Receiver		
TUBES	Nineteen		
POWER SUPPLY	110-120 Volts AC, 60 Cycle	RATING 220 Watts, 1.9 Amp. @ 117 Volts AC	
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)		

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustment of the VHF oscillator is possible by removing the channel selector and fine tuning knobs. Set the fine tuning at the center of its range. The adjustments (located in a circle around the shaft) should be made in sequence from the highest to the lowest channel in the area. Channel 12 adjustment is located at 3 o'clock, proceed in a counter clockwise direction adjusting for best picture and sound.

PICTURE TUBE SAFETY GLASS CLEANING

TABLE MODELS : Remove 2 metal screws from the bottom holding the front of the cabinet. Remove the front. Remove 6 spring clips holding the safety glass and remove the glass. NOTE: Clean with soft cloth and water only.
CONSOLE MODELS: Remove the trim strips at the top and bottom edges of the safety glass by prying off starting at the extreme ends. Slide the upper and lower glass retainer strips to release the safety glass. Remove the safety glass. NOTE: Clean with soft cloth and water only.

SPECIAL ADJUSTMENTS

A. AGC & Sync Stab.
Tune in the strongest station operating in the area. Turn the Sync Stab. control fully clockwise. Adjust the fine tuning until a beat pattern just appears in the picture. Turn the AGC control clockwise until the picture just starts to bend, then back off from this point 1/8 turn. Turn the Horizontal Hold control as far counter clockwise as possible without sync becoming unstable. Turn the Sync Stab. control counter clockwise until the picture just starts to bend, then clockwise about 30 degrees from this point. In noisy areas advance only 15 degrees. Check operation on all channels. The picture should lock in immediately with no sign of bending.

B. Focus
No provision is made to vary the focus on this receiver.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENTS

Adjust Horizontal Hold control until picture synchronizes horizontally. If satisfactory results cannot be obtained, see Horizontal Sweep Circuit Adjustments on page 11.

FUSE DEVICE

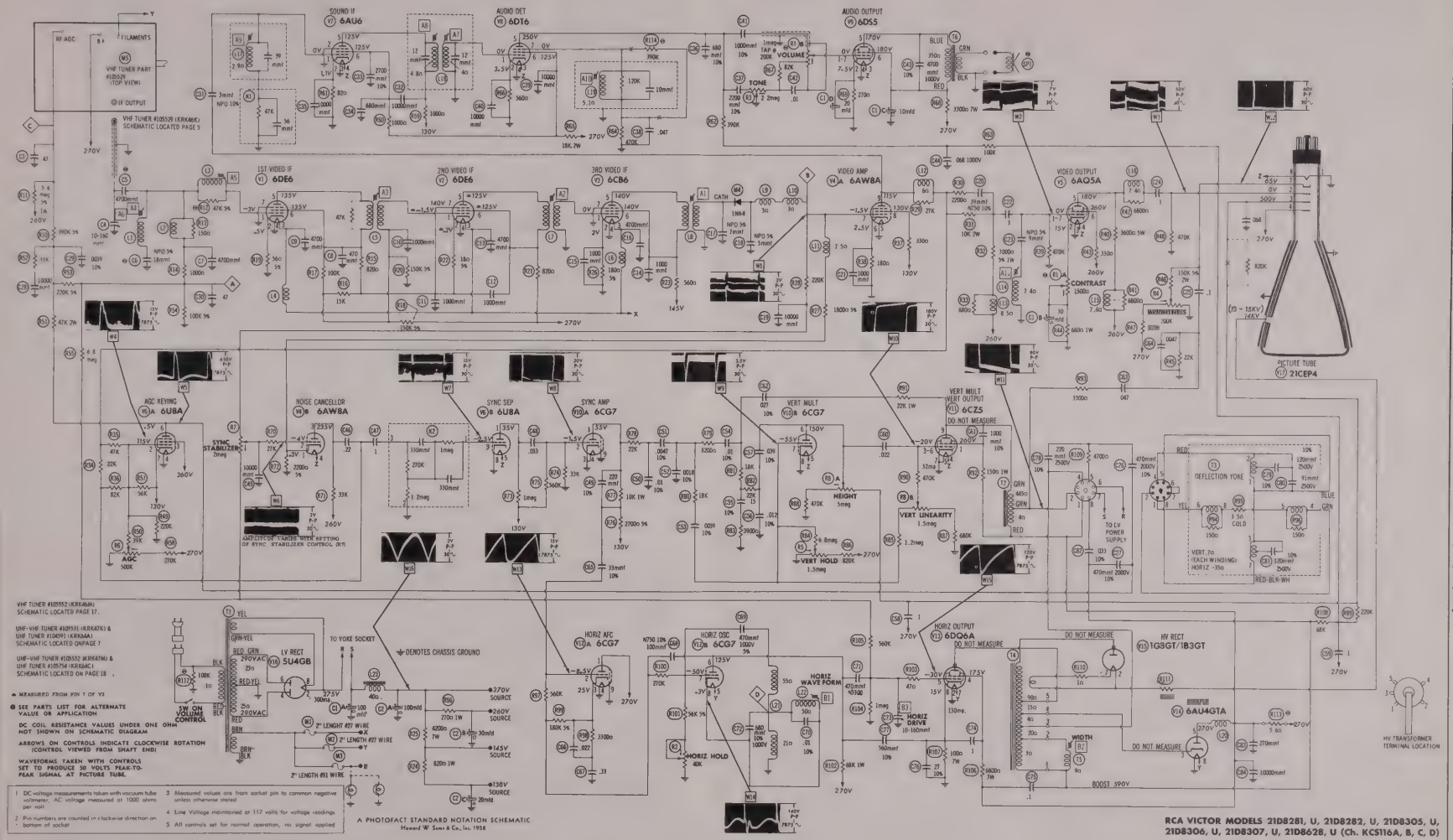
A 5.6Ω fusible resistor (R113) is used for LV power supply protection. (For location, see tube placement chart).

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube. Rotate the two rings around the neck of the tube until the picture is properly centered.

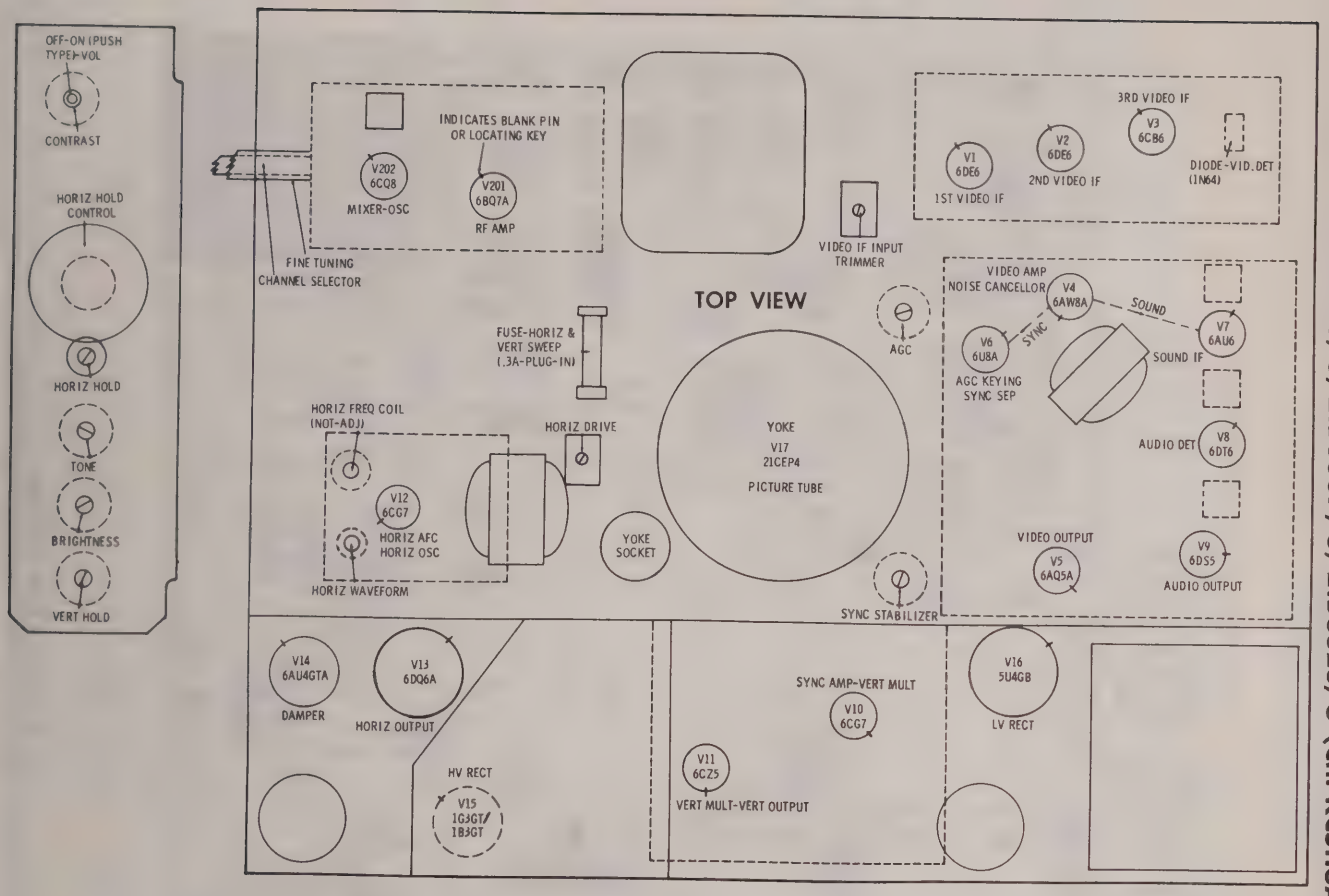
RCA VICTOR MODELS 21D8281, U, 21D8282, U, 21D8305, U, 21D8306, U, 21D8307, U, 21D8628, U (Ch. KCS116A, B, C, D)

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1958 Howard W. Sams & Co., Inc., Indianapolis 5, Indiana. Printed in U.S. of America



RCA VICTOR MODELS 21D8281, U, 21D8282, U, 21D8305, U, 21D8306, U, 21D8307, U, 21D8628, U (Ch. KCS116A, B, C, D)

TUBE PLACEMENT CHART



RCA VICTOR MODELS 21D8281, U, 21D8282, U, 21D8305, U, 21D8306, U, 21D8307, U, 21D8628, U (Ch. KCS116A; B, C, D)

TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce indicated symptoms. Refer to tube placement chart for location and type of tube.

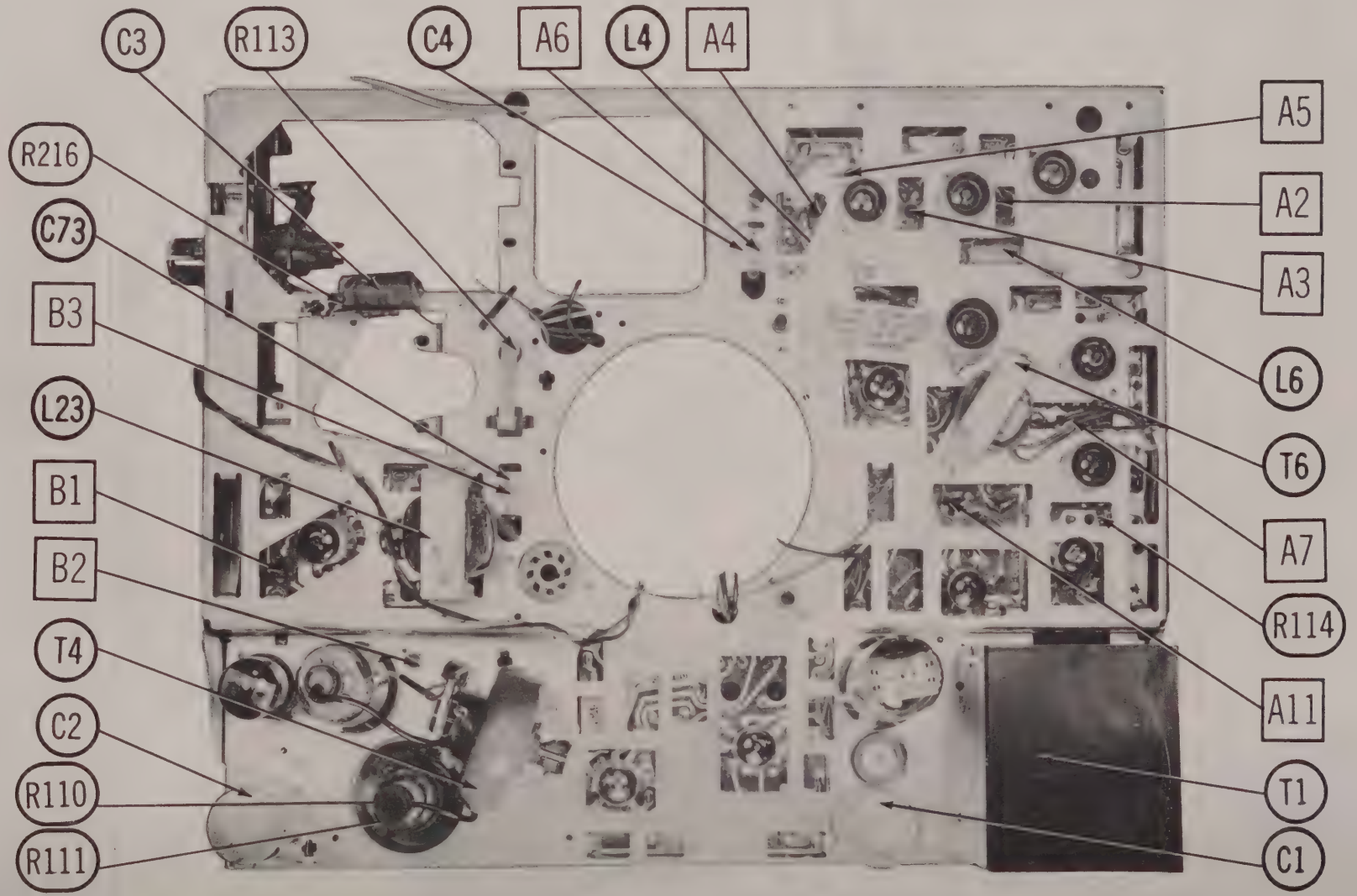
POWER SUPPLY FAILURE
No raster, no sound V16

SWEEP FAILURE
No raster, has sound Fusible Resistor (R113), V12, V13, V14, V15, V17
No vertical deflection V10, V11
Poor vert. linearity or foldover V10, V11
Poor horiz. linearity or foldover V12, V13, V14
Narrow picture V12, V13, V14, V16
Vert. off freq. V10, V11
Horiz. off freq. V12

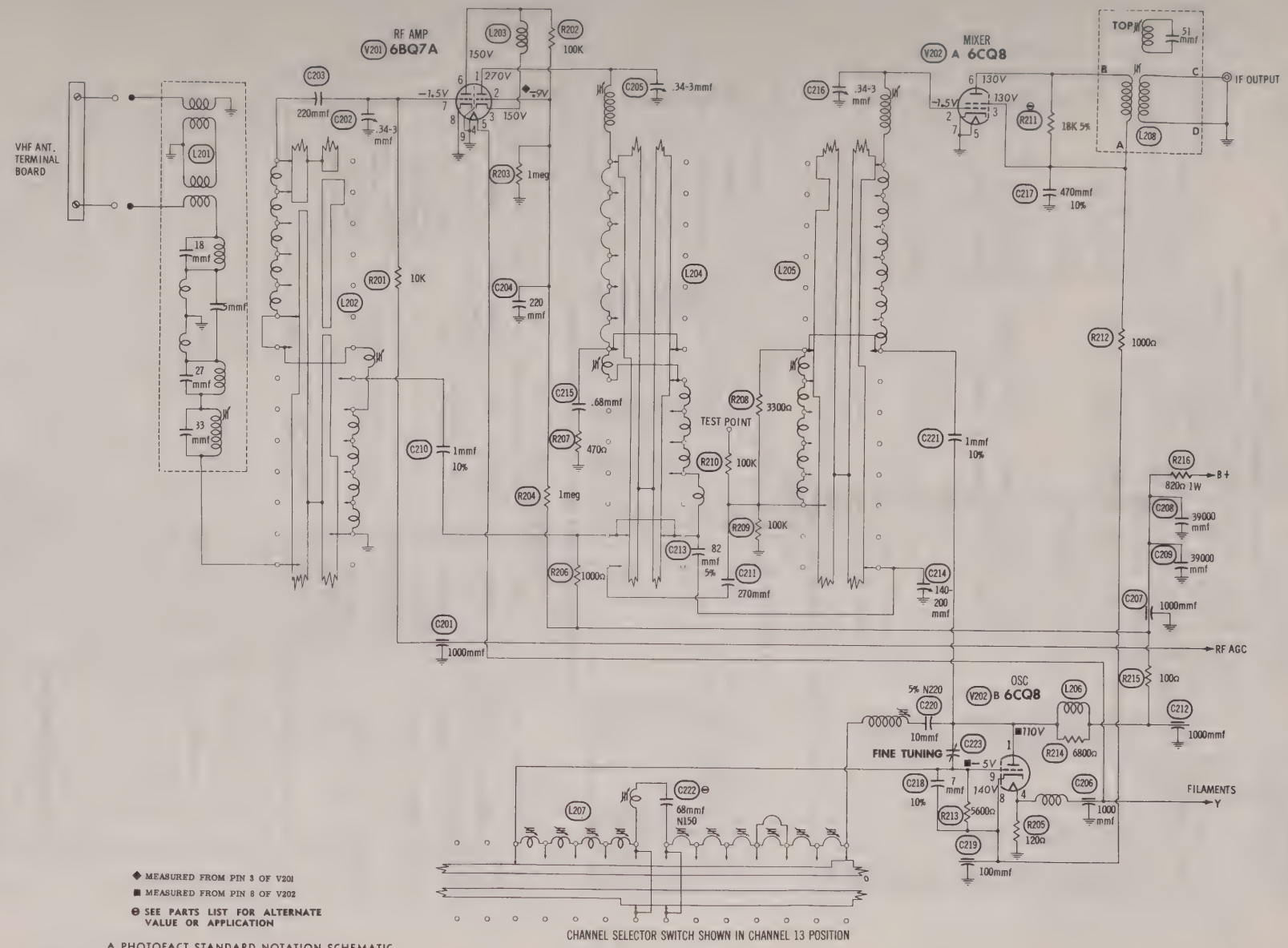
LOSS OF PICTURE OR SOUND
No pic, no sound, has raster V1, V2, V3, Diode (M4), V4
No pic, no sound, has snow V201, V202, V1
No pic, has sound, has raster V4, V5, V17
Has pic, no sound V7, V8, V9
Overloaded picture V6

SYNC FAILURE
No vert. sync V8, V10
No horiz. sync V8, V10, V12
No vert. or horiz. sync V8, V10

FOLDER 4



CHASSIS TOP VIEW



TUNER #105529 (KRK46K)

TUNER PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V201	RF Amp.	6BQ7A	

ITEM No.	USE	TYPE	NOTES
V202	Mixer-Osc.	6CQ8	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT	RCA Victor PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C201	1000		103517	EF-001	MFT-1000				503C-D1	
C202	.34-3		103552							
C203	220		100672	BPD-00022	DD-221	L10T22	ED-220	UC-5322	5GA-T22	
C204	220		100672		MD-221	L10T22	ED-220		5TCC-T22	10%
C205	.34-3		103552							
C206	1000		103517	EF-001	MFT-1000				503C-D1	
C207	1000		103517	EF-001	MFT-1000				503C-D1	
C208	39000		105479							
C209	39000		105479							
C210	1		77690	NPO-SI 1.0	TCZ-1		TCO-1		5TCCB-V1	10%
C211	270		77838	SI 270	D6-271	LT6T27	GP-270	UC-5327	5GA-T27	
C212	1000		103517	EF-001	MFT-1000				503C-D1	
C213	82		103560	1469-000082	TCZ-82	22R5Q82	TCO-82		MS-482	5%
C214	140-200		103519							
C215	.68		71504		TCZ-R68		TCO-.68			
C216	.34-3		103552							
C217	470		78622		D6-471	5R5T47	ED-470		MS-347	10%
C218	7		103523			C10V7C				10%
C219	100		103518	EF-0001	MFT-100				503C-T1	
C220	10		103556							N220 5%
C221	1		77690	NPO-SI 1.0	TCZ-1		TCO-1		5TCCB-V1	10%
C222	68									N150 ①
C223										

① Some versions may use 47mmf in this application (Part #103559).

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		RCA Victor PART No.	NOTES
	OHMS	WATT		
R201	10K		502310	
R202	100K		502410	
R203	1meg		502510	
R204	1meg		502510	
R205	120Ω		502112	
R206	1000Ω		502210	
R207	470Ω		502147	
R208	3300Ω		502233	

ITEM No.	RATING		RCA Victor PART No.	NOTES
	OHMS	WATT		
R209	100K		502410	
R210	100K		502410	
R211	18K 5%		502318	①
R212	1000Ω		502210	
R213	5600Ω		502256	
R214	6800Ω		502268	
R215	100Ω		502110	
R216	820Ω	1	512182	

① Some versions may use 27K 5% in this application (Part #502327).

COILS (RF-IF)

ITEM No.	USE	RCA Victor PART No.	NOTES
L201	Ant. Matching Trans.	103525	Includes Trap Assy.
L202	Ant. Coils	103564	Channel 2-13, Stator Assy. includes C203 & C210
L203	Neut. Coil	76562	
L204	RF Coils	103562	Channel 2-13, Stator Assy. includes C213, C215, R206 & R207

ITEM No.	USE	RCA Victor PART No.	NOTES
L205	Mixer Grid Coils	103563	Channel 2-13, Stator Assy. includes C211, R209, R210 & R208
L206	RF Choke	103524	1.5 Microhenries
L207	Osc. Coils	103561	Channel 2-13, Stator Assy. includes C220 & C222
L208	Mixer Plate Coil	103516	

TUNER #105531 (KRK47K) & 104591 (KRK64A)

ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

Allow a 20 minute warm-up period for the receiver and test equipment.

VIDEO IF ALIGNMENT

Disable the horizontal sweep circuits by connecting 150Ω 10W resistor in series with the plate lead of the horizontal output tube (V13).
Connect the negative lead of a 12.5 volt bias supply to pin 5 (grid) of V13. Positive to chassis.
Connect the negative lead of a 6 volt bias supply to point Ⓐ. Positive to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	150mmf	High side to mixer grid wafer contact thru access hole (adjacent to mixer grid wafer) located in left side of tuner shield. Low side to chassis.	Not used	44.3MC (Unmod)	Any non-interfering channel	USE VTVM. DC probe to point Ⓑ. Common to chassis. (Across Video Det. load).	A1	Adjust for maximum deflection. Adjust generator output to maintain 3 volts on VTVM when finally peaked.
2.	"	"	"	45.5MC	"	"	A2	"
3.	"	"	"	43.0MC	"	"	A3	"
4.	"	"	"	47.25MC	"	"	A4 & Mixer Plate Coil (top)	Increase generator output and adjust A4 and Mixer Plate Coil (top) for MINIMUM deflection.
5.	"	"	44.0MC (10MC Swp)	42.5MC 45.75MC	"	Vert. Amp. thru detector (Fig. 1) to pin 5 (plate) of 6DE6 (V1). Low side to chassis.	Mixer Plate Coil (Bottom), A5, A6	Connect the negative lead of a 3 volt bias supply to point Ⓒ. Connect a 180Ω resistor from plate to screen (pin 5 to 6) of 6DE6 (V1). Use only enough sweep generator output to provide a usable pattern on scope. Adjust for maximum gain and symmetry of response similar to Fig. 2 with markers as shown.
6.	"	"	"	42.5MC 45.0MC 45.75MC	"	Remove detector probe. Vert. Amp. thru 10K to point Ⓑ. Low side to chassis.	A1, A2, A3	Retouch A1 thru A3 for response similar to Fig. 3, if necessary.
7.	"	High side thru pad (Fig. 4) to mixer grid wafer contact thru access hole (adjacent to mixer grid wafer) located in left side of tuner shield. Low side to chassis.	Not used	45.75MC	"	USE VTVM. DC probe to point Ⓑ. Common to chassis.		Adjust generator output to provide exactly 1.5 volts on VTVM.
8.	"	Remove pad. High side to mixer grid wafer contact thru access hole (adjacent to mixer grid wafer) located in left side of tuner shield. Low side to chassis.	"	41.25MC	"	USE VTVM. DC probe to point Ⓑ. Common to chassis. Also connect scope as in step 6.	A3, A1	Retouch for 1.0 to 1.5 volts on VTVM while maintaining response similar to Fig. 3.
9.	Two 130Ω Carbon Resistors	Across antenna terminals with 130Ω in each lead.	44.0MC (10MC Swp)	42.5MC 45.0MC 45.75MC	All VHF Channels	Vert. Amp. thru 10K to point Ⓑ. Low side to chassis.	A1, A2	SLIGHTLY retouch A1 and A2 to correct for any overall tilt that is approximately the same on all channels. Restore Horiz. Sweep Circuit to normal

SOUND IF ALIGNMENT

Connect the negative lead of a 10 volt bias supply to point Ⓐ. Positive to chassis.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
10.	.001mfd	High side to point Ⓑ. Low side to chassis.	4.5MC (Unmod)	Any non-interfering channel	DC probe thru diode probe (Fig. 5) to pin 7 (3rd. Grid) of 6DT6 (V8). Common to chassis. Connect scope across the speaker voice coil.	A7, A8	Adjust for maximum negative DC voltage on VTVM. Use only enough generator output to provide a usable indication on VTVM. Peak with maximum core separated.
11.	"	"	"	"	"	A9	Adjust for maximum negative DC voltage on VTVM. Use only enough generator output to provide a usable indication on VTVM.
12.	Disconnect the diode detector circuit. Turn off the signal generator and tune in the strongest TV signal in the area. Set volume control for normal volume. Set A10 so that core is flush with top of coil form. While observing the scope and listening to the sound adjust A10 for maximum output. Continue clockwise to second larger peak and adjust A10 for maximum output at the second peak.						

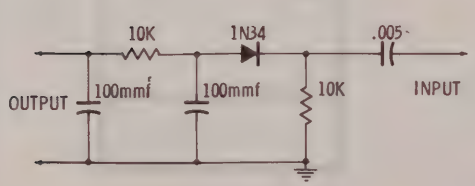


FIG. 1

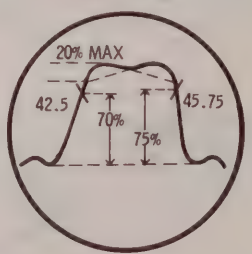


FIG. 2

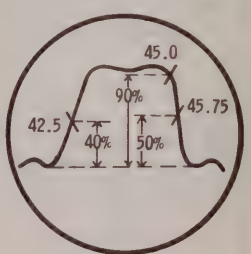


FIG. 3

ALIGNMENT INSTRUCTIONS (cont)

ALTERNATE SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
10.	.001mfd	High side to point (B). Low side to chassis.	4.5MC (Unmod)	Any non-interfering channel	DC probe thru diode probe (Fig. 5) to pin 7 (3rd. Grid) of 6DT6 (V8). Common to chassis. Connect scope across the speaker voice coil.	A7, A8	Adjust for maximum negative DC voltage on VTVM. Use only enough generator output to provide a usable indication VTVM. Peak with maximum core separated.
11.	"	"	"	"	"	A9	Adjust for maximum negative DC voltage on VTVM. Use only enough generator output to provide a usable indication on VTVM.
12.	"	"	4.5MC (400∿ FM 15KC Swp)	"	USE SCOPE. Across speaker voice coil.	A10	Adjust for maximum 400∿ indication on scope. Use only enough signal to produce .7 volts peak to peak on scope when All is peaked.
13.	"	"	"	"	"		Decrease the input signal to MINIMUM usable signal and retouch A7, A8 and A9 for symmetrical breakout similar to Fig. 6.

4.5MC TRAP ALIGNMENT

Set the contrast fully clockwise.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
14.	.01mfd	High side to point (B). Low side to chassis.	4.5MC (400∿ 30% AM)	Any non-interfering channel	Vert. Amp. thru detector probe to pin 2 (grid) of picture tube. Low side to chassis.	All	Adjust for MINIMUM 400∿ indication on scope.

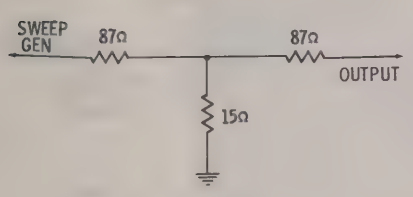


FIG. 4

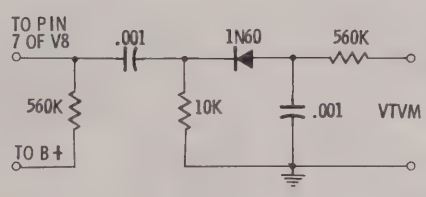


FIG. 5

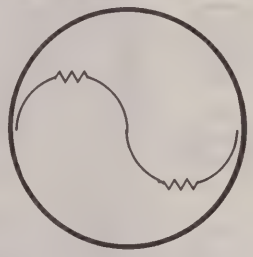
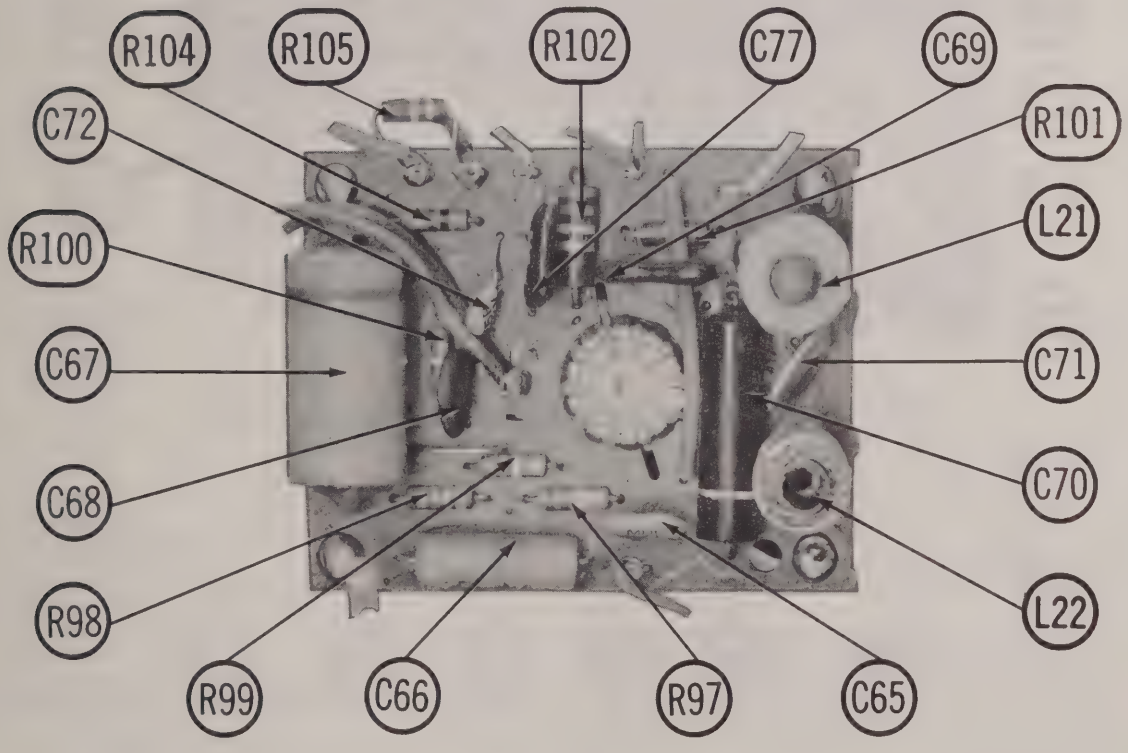
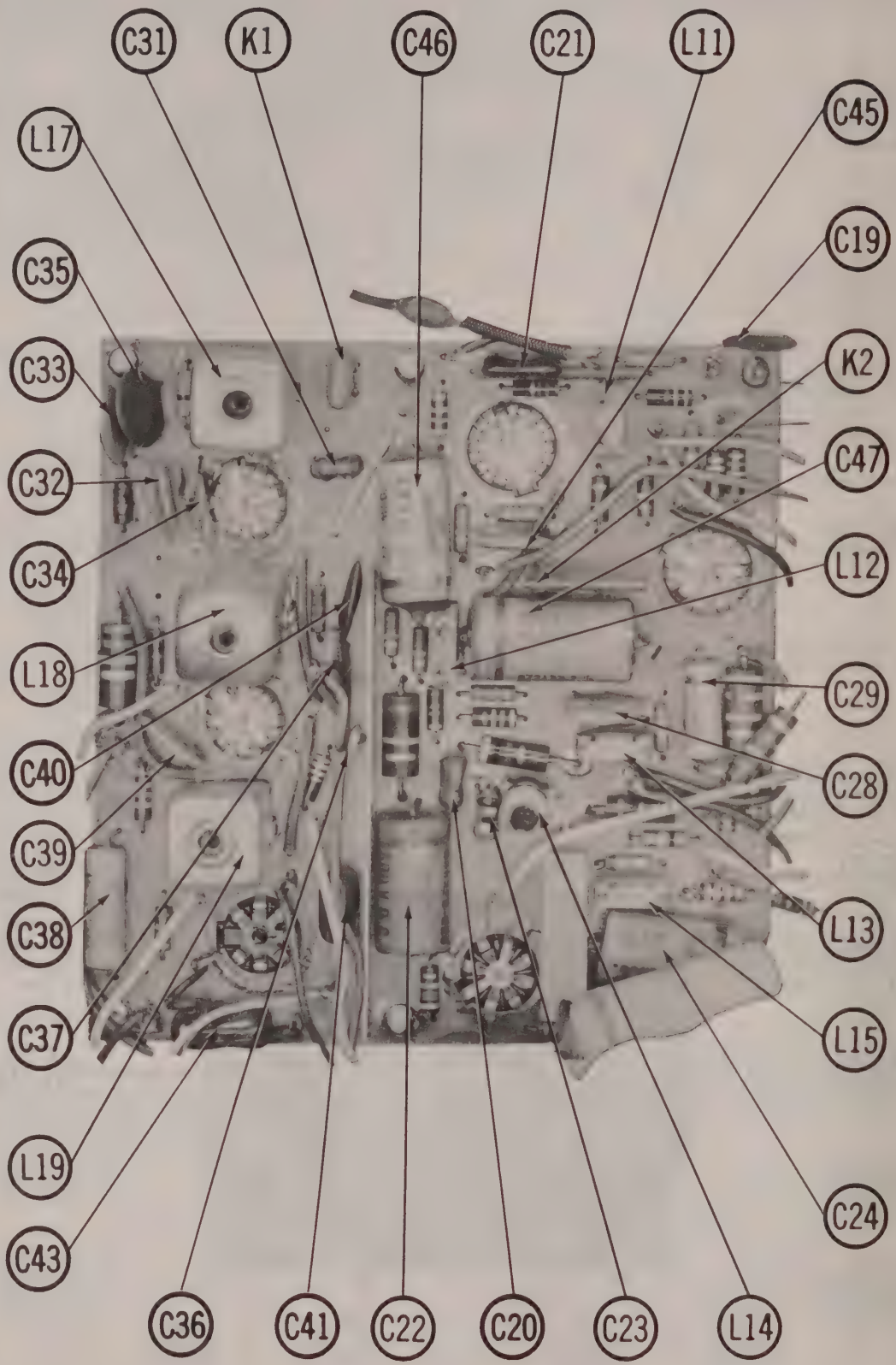


FIG. 6



HORIZ PRINTED BOARD

SET 400 FOLDER 4



SOUND PRINTED BOARD CAPACITOR & INDUCTOR IDENT.

CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Before adjusting the waveform slug (B1) the horizontal drive and width must be properly adjusted.

Set the Horizontal Hold control to the pull-in point. Turn the Width slug (B2) fully counter clockwise and Horizontal Drive trimmer (B3) counter clockwise until a bright vertical line appears near the center of the raster, then turn clockwise until the line just disappears. If no line appears, leave B3 fully counter clockwise.

With the Brightness control set to normal level, adjust the Width slug (B2) for an overscan of approximately 3/4 inch on each side of the screen at normal line voltage.

Connect a short jumper across the terminals of the Horizontal Waveform coil (L22) and short the grid (pin 2) of the 6CG7 (V10) to chassis with a small screwdriver.

Adjust the Horizontal Hold control for an upright picture (may appear to float back and forth across the screen). Remove the jumper from across L22 and adjust B1 to again obtain a picture in an upright position. When B1 is properly adjusted, shorting pin 2 of V10 should not cause the picture to lose sync, but instead cause a SLIGHT sideways shift of the picture. Remove the short from the grid of the 6CG7.

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	1st. Video IF Amp.	6DE6	
V2	2nd. Video IF Amp.	6DR6	
V3	3rd. Video IF Amp.	6CB6	
V4	Video Amp.-Noise Cancellor	6AW8A	
V5	Video Output	6AQ8A	
V6	AGC Keying-Sync Sep.	6U8A	
V7	Sound IF Amp.	6AU6	
V8	Audio Det.	6DT6	
V9	Audio Output	6DE6	
V10	Sync Amp.-Vert. Mult.	6CG7	
V11	Vert. Mult.-Vert.Output	6CE6	
V12	Horiz. AFC-Horiz. Osc.	6CG7	
V13	Horiz. Output	6DQ6A	
V14	Damper	6AU4GTA	
V15	RV Rect	1G3GT/ 1B3GT	
V16	LV Rect	5U4GB	

PICTURE TUBE

ITEM No.	REPLACEMENT DATA: RCA Victor PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	SYLVANIA PART No.	NOTES
V17	21CEP4		21CEP4 ①	21CEP4	① "Silverama" ⑧

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA: RCA Victor PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	≤100	400	100888	AFH84-57-90	D0875	FP420.7		Q-243	TVL-4663.5
B	≤30	50							
C	≤40	400							
D	20	50							
C1A	≤100	400	104301	AFH4-06-40-C0355	FP289.1 TC75	TMQ-121 TD-30-480	Q-025	MT-4630	R2853 *
B	≤30	400		BR3045					
C	≤20	400							

* Non-catalog item.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA: RCA Victor PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C3	.47	200	78148A	P288N-47		CUB2P47		GEM-2047	2TM-P47	
C4	10-160		100849							
C5	4700		73473	BPD-0047	DD-472	BYA10D47M	ED-0047	UC-5347	5HK-D47	①
C6	18		102546		TC2-18		TCO-18			NPO 5%②
C7	4700		73473	BPD-0047	DD-472	BYA10D47M	ED-0047	UC-5347	5HK-D47	
C8	470		73622	BPD-00047	DD-471	BYA10T47	ED-470	UC-5347	5GA-T47	
C9	4700		73473	BPD-0047	DD-472	BYA10D47M	ED-0047	UC-5347	5HK-D47	
C10	1000		77252	BPD-001	DD-102	BYA10D1M	ED-1000	DC521	5HK-D1	
C11	1000		77253	BPD-001	DD-102	BYA10D1M	ED-1000	DC521	5HK-D1	
C12	1000		102234A	BPD-001	DD-102	BYA10D1M	ED-1000	DC521	5HK-D1	
C13	4700		73473	BPD-0047	DD-472	BYA10D47M	ED-0047	UC-5347	5HK-D47	
C14	1000		102234A	BPD-001	DD-102	BYA10D1M	ED-1000	DC521	5HK-D1	
C15	1000		77253	BPD-001	DD-102	BYA10D1M	ED-1000	DC521	5HK-D1	
C16	4700		73473	BPD-0047	DD-472	BYA10D47M	ED-0047	UC-5347	5HK-D47	
C17	7		104177							NPO 5%
C18	5		104178							NPO 5%
C19	10000		73980	BPD-01	DD-103	BYA10I	ED-01	DC511	5HK-I1	
C20	39		102694	N750-S1 39	TCN-39	TC7-39				N750 10%
C21	1000		104226	1469-001		1R5D1	CY20C102J	MCE251	MS-21	5%
C22	.1	600	105335	P688N-1	DF-104	CUB6P1		GEM-601	6TM-P1	
C23	9		102647							NPO 5%
C24	.1	600	105335	P688N-1	DF-104	CUB6P1		GEM-601	6TM-P1	
C25	.1	400	73651	P488N-1	DF-104	CUB4P1		GEM-401	4TM-P1	
C26	470	2000	104363							10%
C27	470	2000	104383							10%
C28	10000		73980	BPD-01	DD-103	BYA10I	ED-01	DC511	5HK-I1	
C29	.0039	400	102218A							10%
C30	.47	200	73787	P288N-47		CUB2P47		GEM-2047	2TM-P47	
C31	3		104204				TCO-3			NPO 10%
C32	10000		73980	BPD-01	DD-103	BYA10I	ED-01	DC511	5HK-I1	
C33	2700		104131		DD-332	L10D27	ED-0027			10%
C34	680		104135	BPD-00068	DD-681	BYA10T68	ED-680	UC-5368	5GA-T68	
C35	10000		73980	BPD-01	DD-103	BYA10I	ED-01	DC511	5HK-I1	
C36	680		104135			L10T68	ED-680			10%
C37	2300		104399			L10D22	ED-0022			10%
C38	.047	200	104133	P288N-047		CUB2S47		GEM-4147	2TM-S47	
C39	10000		73960	BPD-01	DD-103	BYA10I	ED-01	DC511	5HK-I1	
C40	10000		73980	BPD-01	DD-103	BYA10I	ED-01	DC511	5HK-I1	
C41	1000	500							MS-21	10%
C42	.01	200	101000A	P288N-01	DD-103	CUB4S1	GP-10000	GEM-401	4TM-S1	
C43	4700	1000								10%
C44	.068	1000	73815	P1088N-068		CUB10S68		GEM-10168	10TM-S68	
C45	10000		73960	BPD-01	DD-103	BYA10I	ED-01	DC511	5HK-I1	
C46	.22	200	100650A	P288N-22		CUB4P22		GEM-4022	4TM-P22	
C47	.1	600	104311	P688N-1	DF-104	CUB6P1		GEM-601	6TM-P1	
C48	.033	400	104143	P488N-033		CUB4S33		GEM-4133	4TM-S33	
C49	220		39636	1469-00022	D6-321	22R5T22	CY10221K		MS-322	10%
C50	.01	400	102220A					GEM-1401		10%
C51	.0047	600	102235A					GEM-16347		10%
C52	.0018	600	105888							10%
C53	.0039	600	78221							10%
C54	.01	200	101000A					GEM-1401		10%
C55	.15	200	104908					GEM-3015		10%
C56	.012	400	103196							10%
C57	.039	400	104907							10%
C58	.1	400	104487	P488N-1	DF-104	CUB4P1		GEM-401	4TM-P1	
C59	.1	400	104487	P488N-1	DF-104	CUB4P1		GEM-401	4TM-P1	
C60	.022	800	104482	P888N-022		CUB8S22		GEM-6122	6TM-S22	
C61	1000		104222	BPD-001		L10D1	ED-1000	UC-521	5HK-D1	10%
C62	.027	600	78348							10%
C63	.047	400	104909	P488N-047		CUB4S47		GEM-4147	4TM-S47	
C64	.0047	400	104910	P488N-0047	DD-472	CUB4D47	GP-4700	GEM-6247	6TM-D47	
C65	33		105348	BPD-000033	DD-330	L10Q33	ED-33		5TCC-Q33	10%
C66	.022	200	105870	P288N-022		CUB4S22		GEM-4122	2TM-S22	
C67	.33	200	105871	P288N-33				GEM-3033		
C68	100		105674	N750-D1 100	TCN-100	C10T1U	TC7-100	NT-531	5TCU-T1	N750 10%
C69	470	1000	105872							5%
C70	.01	400	105676					GEM-1401		10%
C71	680		105518							N3300
C72	470	1000	105875			BYA10T47				10%
C73	10-160		100849							
C74	.1	600	73567	P688N-1	DF-104	CUB6P1		GEM-601	6TM-P1	
C75	.1	600	73567	P688N-1	DF-104	CUB6P1		GEM-601	6TM-P1	

PARTS LIST AND DESCRIPTIONS

CAPACITORS (cont)

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA: RCA Victor PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C76	.27	200	73786							10%
C77	560		105673	1469-00056		1R5T56	CY15C561K		MS-356	10%
C78	220	2500	104385							10%
C79	120	2500	103536							10%
C80	91	2500	103525							10%
C81	120	2500	103536							10%
C82	.033	400	73522							10%
C83	270		78579	1468-00027	DD-371	5W5T27	ED-270		1FM-327	
C84	10000		73960	BPD-01	DD-103	BYA10I	ED-01	DC511	5HK-I1	

① Not used in Ch. KCS116C, D.
③ Ch. KCS116C, D use 15mmf in this application (Part #103614).

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA: RCA Victor PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1500Ω	½	105651				UE193S	Contrast ①
B	1meg	½					Not Req.	Volume-Tap ⑨ 300K ①
C	Switch						Not Req.	
R2A	40K	½	105652	AB-31	A47-50K-8	Q1-123	PTA54L	Horiz. Hold
B	Shaft			AK-19	RN-3	TQ	Not Req.	
R3A	2.5meg	½	105650	B-33	A47-2.5meg-8	Q1-239	U355	Tone
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R4A	200K	½	102409	B-46	A47-200K-8	Q1-129	U43	Brightness
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R5A	1.5meg	½	102410	B-742	A47-1.5meg-8	Q1-138	TA156L	Vert. Hold
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R6A	500K	½	100863	AB-61		B17-133	PTA56R	AGC
B	Shaft			AK-1		TM3	Not Req.	
R7A	2meg	½	100863	BX-75	A47-2meg-8	Q1-139	TA26L	Sync Stabiliser
B	Shaft			Not Req.	FKS-1/4	RQ	Not Req.	
R8A	6meg		104905					Height
B	1.5meg							Vert. Lin.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise noted.

ITEM No.	RATING OHMS	RATING WATT	RCA Victor PART No.	NOTES
R10	390K 5%		502439	
R11	5.6meg 5%	1	512556	
R12	47K 5%		502347	Note 1
R13	150Ω		502115	
R14	1000Ω		502210	
R15	820Ω		502162	
R16	10K		502315	
R17	100K		502410	
R18	150K 5%		502415	
R19	560 5%		502054	
R20	150K 5%		502415	
R21	820Ω		502162	
R22	1MΩ 5%		502318	
R23	560Ω	1	502156	
R24	820Ω	1	512162	
R25	4300Ω	7	100946	
R26	180Ω 5%		502118	
R27	1800Ω 5%		502218	
R28	220K		502422	
R29	27K		502327	
R30	2200Ω		502222	
R31	10K	2	512310	
R32	3000Ω 5%	1	512330	
R33	680Ω		502168	
R34	22K		502322	
R35	47K		502347	
R36	62K		502362	
R37	330Ω		502133	
R38	180Ω		502118	
R39	470K		502447	
R40	3900Ω	5	105665	
R41	5800Ω		502268	
R42	6800Ω		502268	
R43	330Ω		502133	
R44	680Ω	1	512168	
R45	22K		502322	
R46	180K 5%	2	512418	
R47	220K		502422	
R48	470K		502447	
R49	220K		502422	
R50	39K		502339	
R51	47K	2	512347	
R52	33K		502333	
R53	220K 5%		502422	
R54	100K 5%		502410	
R55	5.6meg		502268	
R56	270Ω	1	512127	
R57	56K		502356	
R58	370K		502427	
R59	10000Ω		502210	
R60	10000Ω		502210	
R61	82Ω		502083	

ITEM No.	RATING OHMS	RATING WATT	RCA Victor PART No.	NOTES
R62	390K		502439	
R63	100K		502410	
R64	470K		502447	
R65	16K	2	512318	
R66	560Ω		502156	
R67	82K		502362	
R68	3300Ω	7	102417	
R69	270Ω		502127	
R70	27K		502327	
R71	33K		502333	
R72	2200Ω 5%		502222	
R73	1meg		502510	
R74	33K		502333	
R75	560K		502456	
R76	700K 5%		502237	
R77	10K	1	512310	
R78	22K		502322	
R79	5800Ω		502282	
R80	18K		502318	
R81	18K		502318	
R82	22K		502322	
R83	3900Ω		502239	
R84	6.8meg		502568	
R85	1.5meg		502512	
R86	820K		502482	
R87	680K		502468	
R88	470K		502447	
R89	220K		502422	
R90	470K		502447	
R91	22K	1	512322	
R92	150Ω	1	512115	
R93	3300Ω		502233	
R94	150Ω		502115	
R95	3.8Ω Cold			
R96	150Ω			
R97	560K		502456	
R98	3300Ω		502233	
R99	180K 5%		502418	
R100	270K		502427	
R101	56K 5%		502356	
R102	68K	1	512368	
R103	470		502047	
R104	1meg		502510	
R105	560K		502456	
R106	6800Ω	3	105662	
R107	100Ω	7	104188	
R108	68K		502368	
R109	4700Ω		502247	
R110	1Ω		104382	
R111	1000Ω		502210	
R112	100K		502410	Note 3
R113	5.6Ω			Note 3
R114	390K			Note 4

Note 1. Ch. KCS116C, D use 27K 5% in this application (Part #502327).
Note 2. Some versions may use 820K in this application (Part #502482).
Note 3. Some versions may use a 3/10A fuse in this application (Part #102164).
Note 4. Not used in some versions.

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	REPLACEMENT DATA: RCA Victor PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No
T1	117VAC ⑨1.9A	580VCT ⑨.300A	5V ⑨ 3A	105687						
		SEC. 3	SEC. 4 SEC. 5							
		6.3V ⑨ 2.8A								

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No	USE	REPLACEMENT DATA: RCA Victor PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	Vert. Output	105649							
T2A	Yoke-Horiz (16.4MH)	105631 ①	MDF-913 ②		Y-110 ②	DY-26A ②		Y-60-2 ②	
B	(110°)-Vert.(12.6MH)								
M6	Rear Cover & Centering Device	104680							
	Yoke Clamp	104609							
T4	Horiz. Output	105648		HVO-173 * ③			HO-289 * ③		
T5	Width Coil (1.5-11MH)	104086		MWC-11 ④	201R12 ④	WC-8	WC-22	WLC-5	

① Includes R94, R95, R96, C80, C81 and C82.
③ Use original rear cover and centering device.
④ Drill new mounting hole(s).
⑤ Do not use tap.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type Is Listed

	ORIGINAL TERMINAL CONNECTIONS	Halldorson Replacement Connections	Merit Replacement Connections	Ram Replacement Connections	Stancor Replacement Connections	Thordarson Replacement Connections	Triad Replacement Connections
	5		5		5		
	4		4		4		
	3		3		3		
	2		2		2		
	1		1		1		
Connect Width Coil Across	2 & 1		2 & 1		2 & 1		

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA: RCA Victor PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No	NOTES
T6	7800Ω	3-4Ω	100037	21D03	A-3020		A-3849	25S48	5-9Z	

SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	REPLACEMENT DATA: RCA Victor PART No.	QUAM PART No.	NOTES
SP1	5"	PM	3-4Ω	77000 ①	5A07	① Used in Models 21D8281, U, 21D8282, U, 21D8305, U, 21D8306, U, 21D8307, U, 21D8308, U. ② Used in Models 21D8528, U
	8"	PM	3-4Ω	54564 ②	8A21	
	3½"	PM	9Ω	102119 ②	3A15T29	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA: RCA Victor PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1	47.25MC Trap	104141					
L2	RF Choke	102394					
L3	1st. Video IF	104140					
L4	Fil. Choke						
L5	2nd. Video IF	104139					
L6	Fil. Choke						
L7	3rd. Video IF	104139					
L8	4th. Video IF	104139					
L9	RF Choke	102839	19-1006	TV-192	6152		18 Microhenries
L10	RF Choke	102639	19-1006	TV-192	6152		18 Microhenries
L11	Shunt Peaking Coil	105668	19-3250	TV-185	6181	VP-6	250 Microhenries
L12	Series Peaking Coil	104904	19-3180	TV-184	6180	VP-5	180 Microhenries
L13	Shunt Peaking Coil	104230	19-3300	TV-199	6155		300 Microhenries
L14	4.5MC Trap	104903					
L15	Shunt Peaking Coil	104239	19-3125	TV-195	6153	VP-4	120 Microhenries
L16	Series Peaking Coil	104229	19-3125	TV-195	6153	VP-4	120 Microhenries
L17	1st. Sound IF	104136					Includes cap.
L18	2nd. Sound IF	104137					Includes caps.
L19	Quadrature Coil	104234					Includes cap. & resistor
L20	RF Choke	78640		19-1001	BC-562	4804	1.5 Microhenries IRC Part #CL-1

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA: RCA Victor PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	Thordarson PART No	NOTES
L21	76Ω *		105687						Horiz. Freq * Tapped @ 21Ω
L22	50Ω		102195						Horiz. Waveform

FILTER CHOKE

ITEM No.	RATINGS CURRENT (Measured)	RATINGS DC RES	RATINGS INDUCTANCE (0 CURRENT 1000 ~/s.)	REPLACEMENT DATA: RCA Victor PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No
L23	300A	40Ω	1.2 Hy	77676	C5037 ①	C2996 ①		C-2326 ①	26C44 ①	C-23X

① Drill new mounting hole.

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	RCA Victor PART No.	REPLACEMENT DATA	
XC1	Sound IF Grid	56mmf, 47K	104339	Centralab	RC-421
XC2	Sync Sep. Coupling	330mmf, 330mmf, 1meg, 1.2meg, 270K	105677		

PARTS LIST AND DESCRIPTIONS (Continued)

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			RCA Victor PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	2" Length #27 Wire							
M2	2" Length #27 Wire							
M3	2" Length #31 Wire							

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA			NOTES
		RCA Victor PART No.	CBS PART No.	SYLVANIA PART No.	
M4	1N64	105517	1N64	1N60	Video Det. (Pigtail)

MISCELLANEOUS

ITEM No.	PART NAME	RCA Victor PART No.	NOTES
M5	Tuner	105529	VHF (KRK46K) Ch. KCS116A
	Tuner	105552	VHF (KRK46M) Part of Assy. KRK67A - Ch. KCS116C
	Tuner	105531	UHF-VHF (KRK47K) Ch. KCS116B
	Tuner	105532	UHF-VHF (KRK47M) Ch. KCS116D
	Tuner	104591	UHF (KRK64A) Ch. KCS116B
	Tuner	105754	UHF (KRK64C) Ch. KCS116D
M6	Centering Device	104460	Includes yoke rear cover
	Printed Board	105628	Video IF, less tubes, Ch. KCS116A, B
	Printed Board	105629	Video IF, less tubes, Ch. KCS116C, D
	Printed Board	105627	Video, AGC, Sync & Sound, less tubes
	Printed Board	105631	Sync & Vert., less tubes
	Printed Board	105630	Horiz. Osc., less tubes

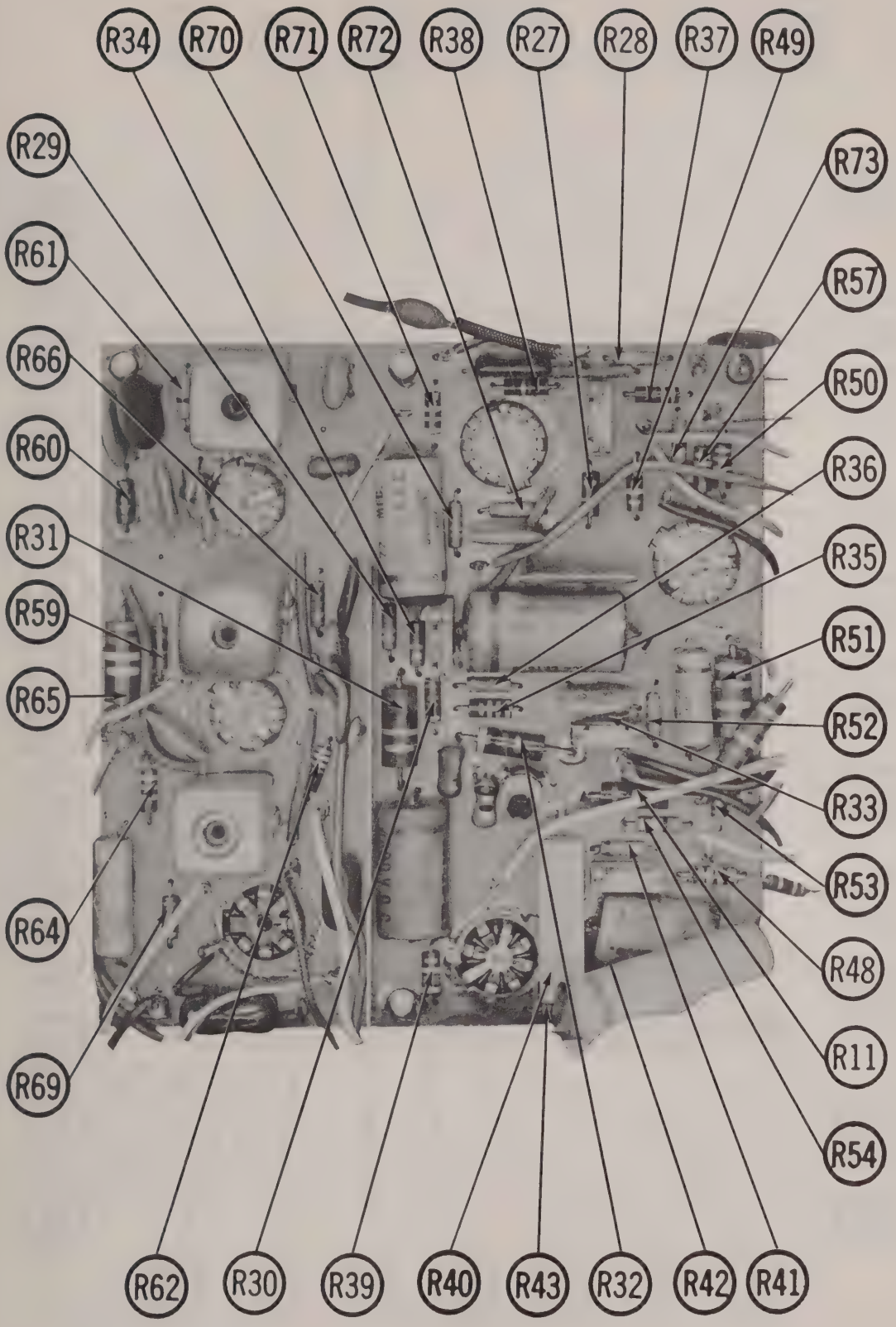
CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

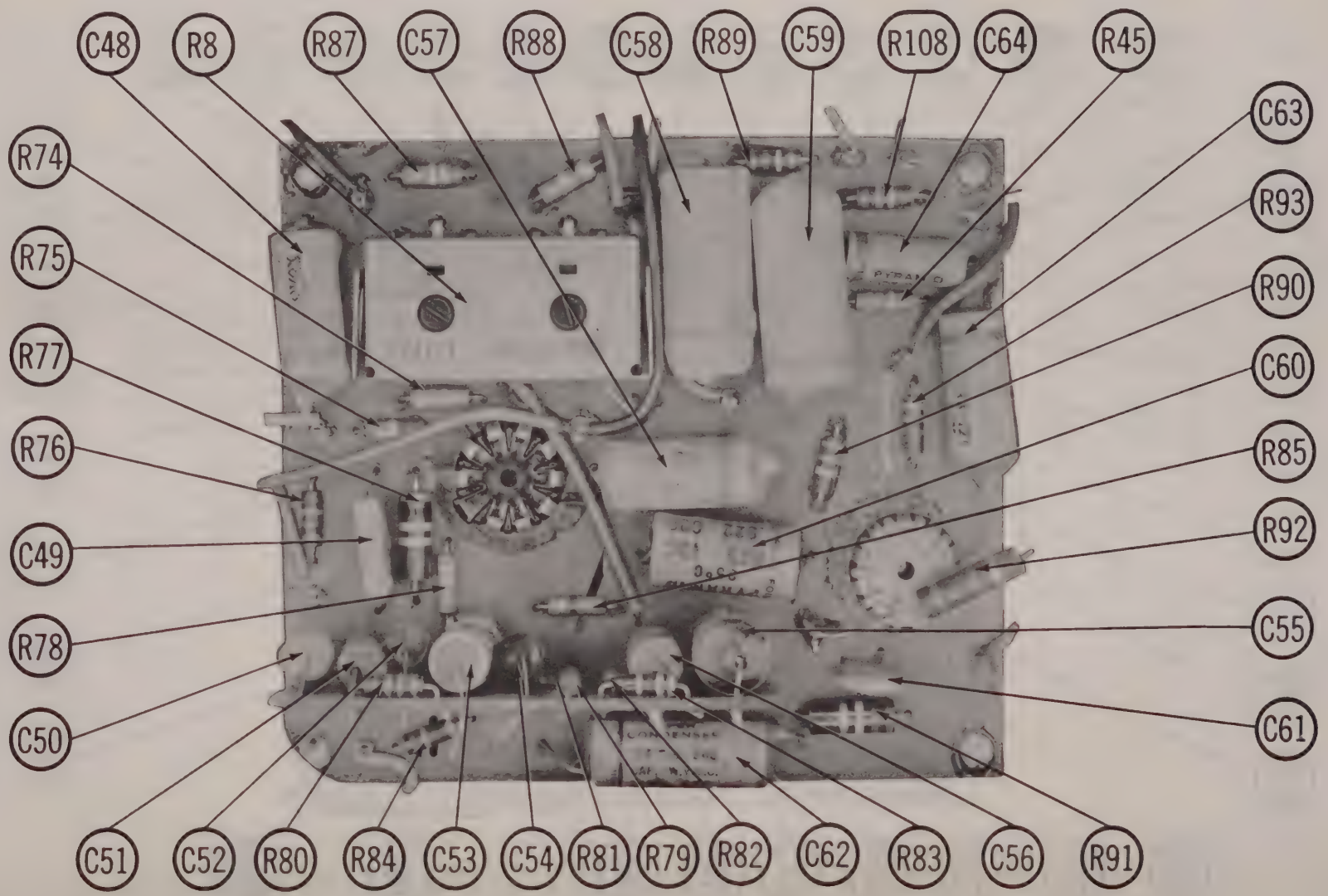
NAME	PART NO.	DESCRIPTION
Safety Glass	104641	Models 21D8281, U, 21D8282, U, 21D8305, U, 21D8306, U, 21D8307, U
Safety Glass	104252	Models 21D8628, U
Mask	104633	Models 21D8281, U, 21D8282, U, 21D8305, U, 21D8306, U, 21D8307, U
Mask	104247	Models 21D8628, U
Knob	102581	Brightness, Vert. Hold, Horiz. Hold, Tone
Knob	104395	Contrast, Models 21D8281, U, 21D8306, U, 21D8307, U
Knob	100621B	On-off-volume, Models 21D8281, U, 21D8306, U, 21D8307, U
Knob	104398	Fine Tuning, Models 21D8281, U, 21D8306, U, 21D8307, U
Knob	104303	VHF Channel Selector, Models 21D8281, 21D8306, 21D8307
Knob	104306	VHF/UHF Channel Selector , Models 21D8281U, 21D8306U, 21D8307U
Knob	102578	UHF Tuning, " " " "
Knob	104638	UHF Dial Escutcheon, " " " "
Knob	104400	Contrast, Models 21D8282, U
Knob	100620B	On-off-volume, Models 21D8282, U
Knob	104401	Fine Tuning, Models 21D8282, U
Knob	104069	VHF Channel Selector, Model 21D8282
Knob	104070	VHF/UHF Channel Selector, Models 21D8282U
Knob	102580	UHF Tuning, Model 21D8282U
Knob	104639	UHF Dial Escutcheon, Model 21D8282U
Knob	104386	Contrast, Models 21D8305, U
Knob	101138B	On-off-volume, Models 21D8305, U
Knob	104397	Fine Tuning, Models 21D8305, U
Knob	104304	VHF Channel Selector, Model 21D8305
Knob	104305	VHF/UHF Channel Selector, Model 21D8305U
Knob	102653	UHF Tuning, Model 21D8305U
Knob	104637	UHF Dial Escutcheon, Model 21D8305U
Knob	104396	Contrast, Models 21D8628, U
Knob	101140B	On-off-volume, Models 21D8628, U
Knob	104399	Fine Tuning, Models 21D8628, U
Knob	104404	Channel Selector, Models 21D8628, U
Knob	104521	UHF Dial Escutcheon, Model 21D8628U
Knob	104405	UHF Tuning, Model 21D8628U
VHF Dial	104584	VHF Channel, Model 21D8628
UHF-VHF Dial	104585	VHF-UHF Channel, Model 21D8628U
Antenna	104366	Cabinet Back Assy., Models 21D8306, U, 21D8307, U
Antenna	104634	Cabinet Back Assy., Models 21D8305, U
Cabinet	Z4284	Models 21D8281, U
Cabinet	Z4285	Models 21D8282, U
Cabinet	Z4286	Models 21D8305, U
Cabinet	Z4287	Models 21D8306, U
Cabinet	Z4288	Models 21D8307, U
Cabinet	Z4289	Models 21D8628, U

WIRING DATA

High Voltage Lead	Use BELDEN No.	8869
Shielded Hook-up Wire	Use BELDEN No.	8885 (Single Conductor)
		8738 (Two Conductor)
General-use Unshielded Hook-up Wire	Use BELDEN No.	8530 (Solid) Available in Ten Colors
		8524 (Stranded) Available in Ten Colors
Power Cord (Interlock Type)	Use BELDEN No.	8874
300Ω Tuner Input Lead	Use BELDEN No.	8225
300Ω Antenna Lead-in	Use BELDEN No.	8230 or 8275
Antenna Rotor Cable	Use BELDEN No.	8464 (Flat) or 8484 (Round) - 4 Conductor
		8485 (Round) - 5 Conductor
		8488 (Round) - 8 Conductor



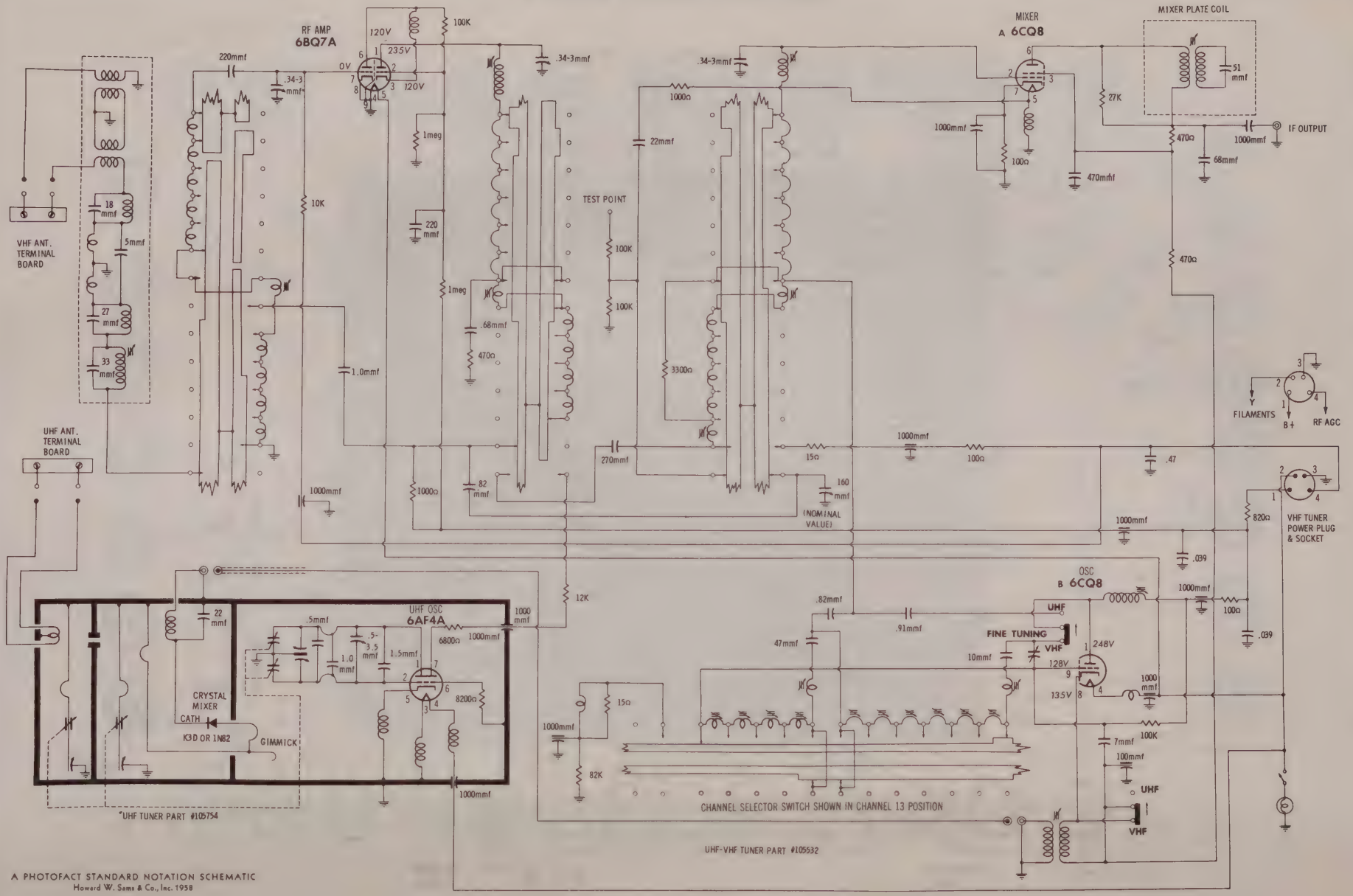
SOUND PRINTED BOARD RESISTOR IDENT



VERTICAL PRINTED BOARD

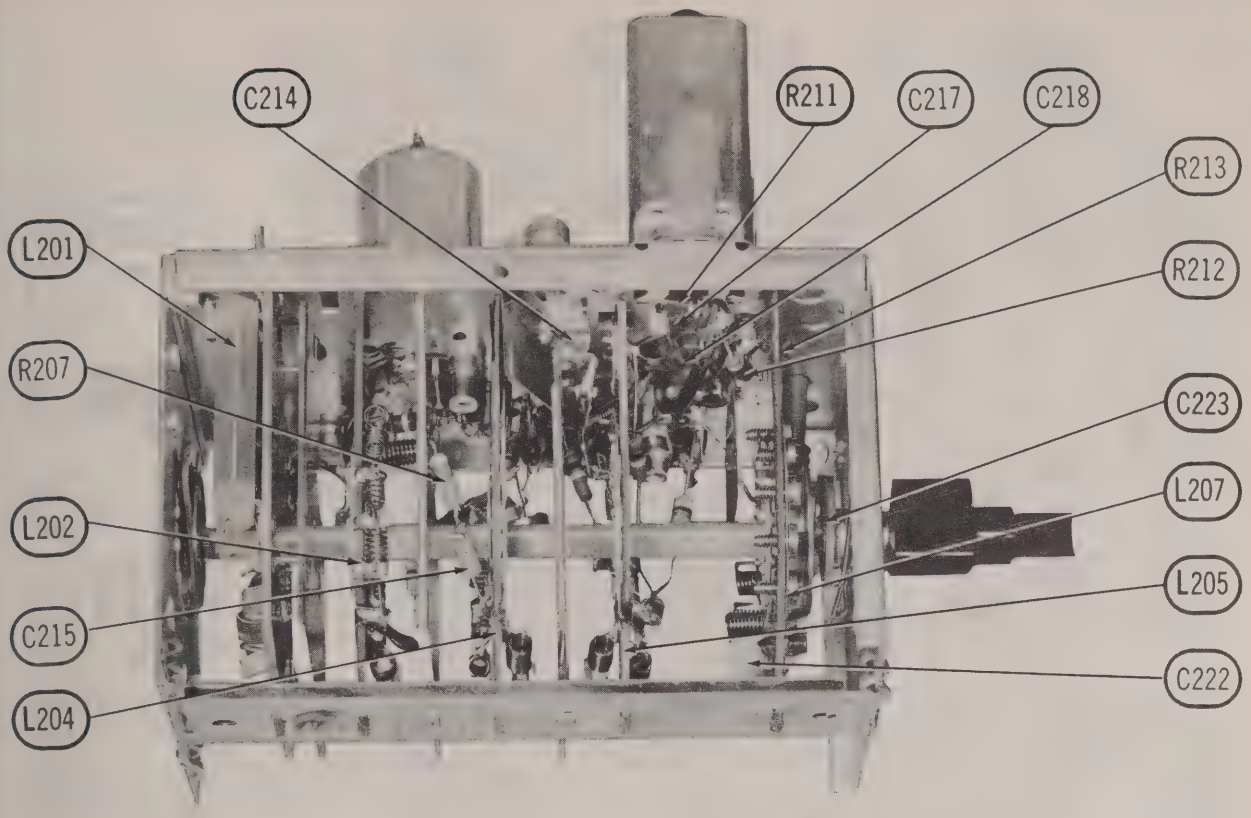
TUNER #105552 (KRK46M)

A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1958

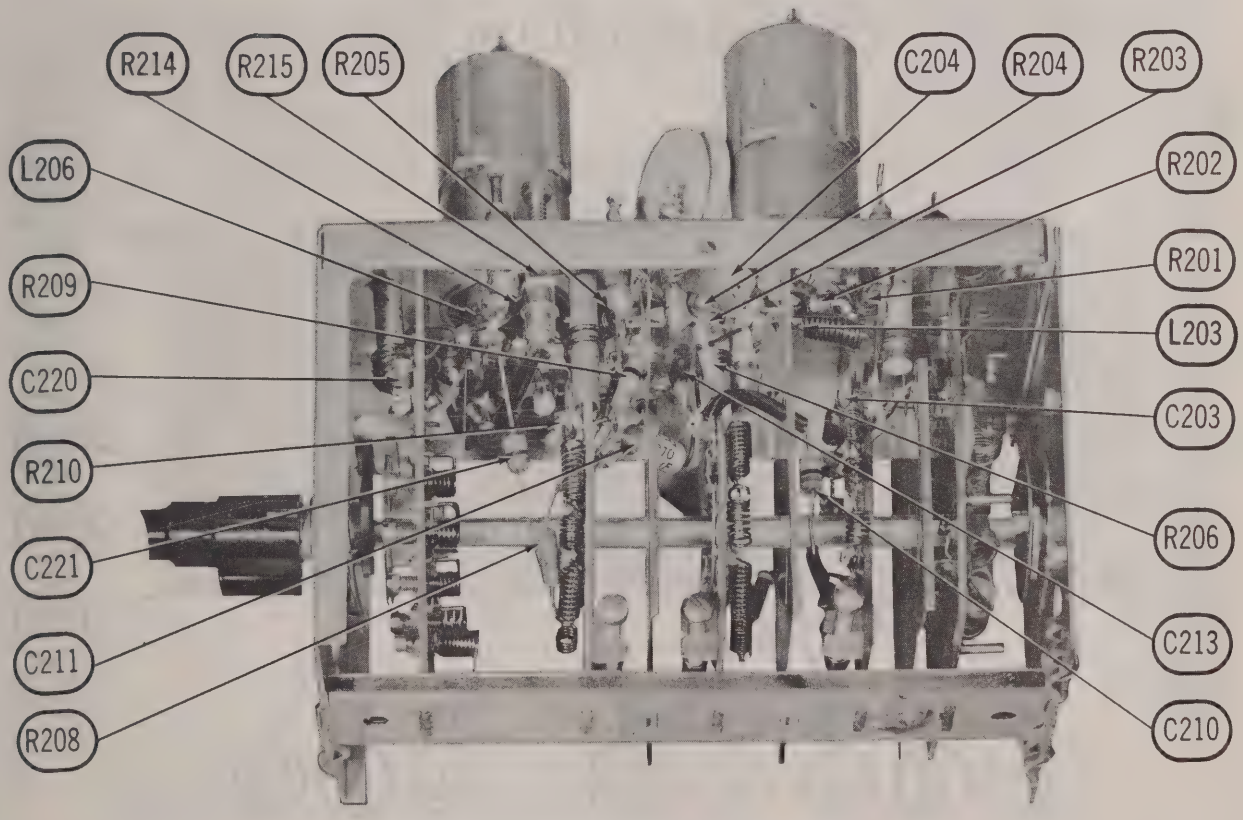


A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1958

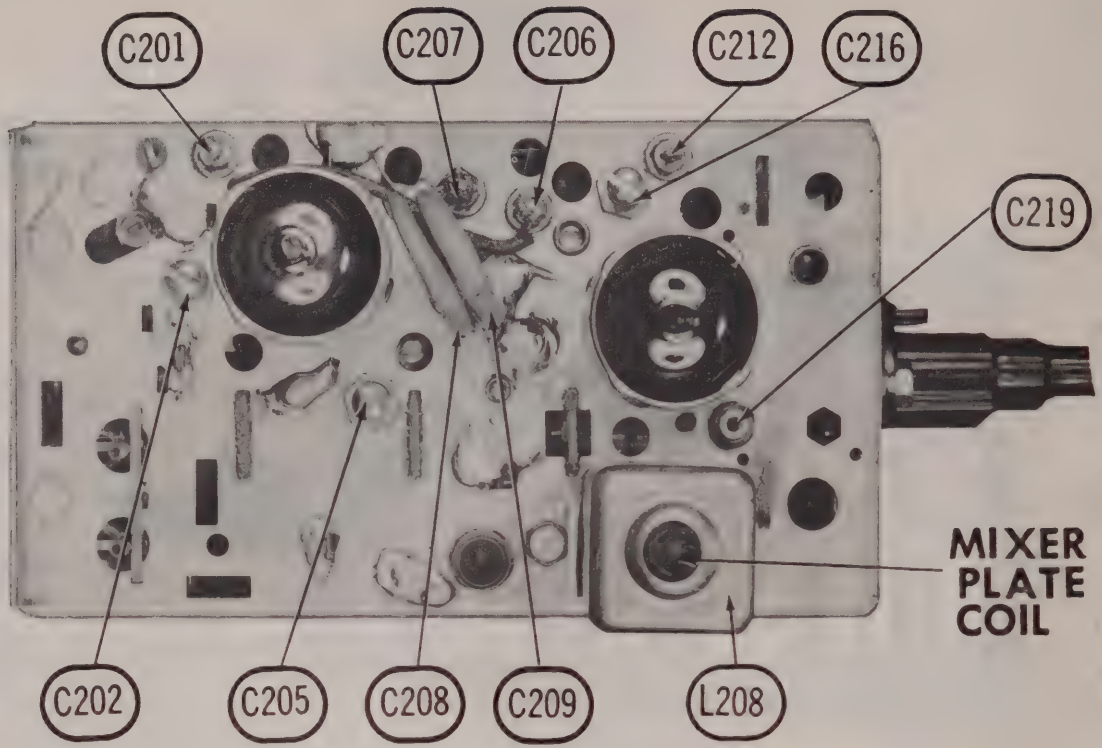
TUNER #105532 (KRK47M) & 105754 (KRK64C)



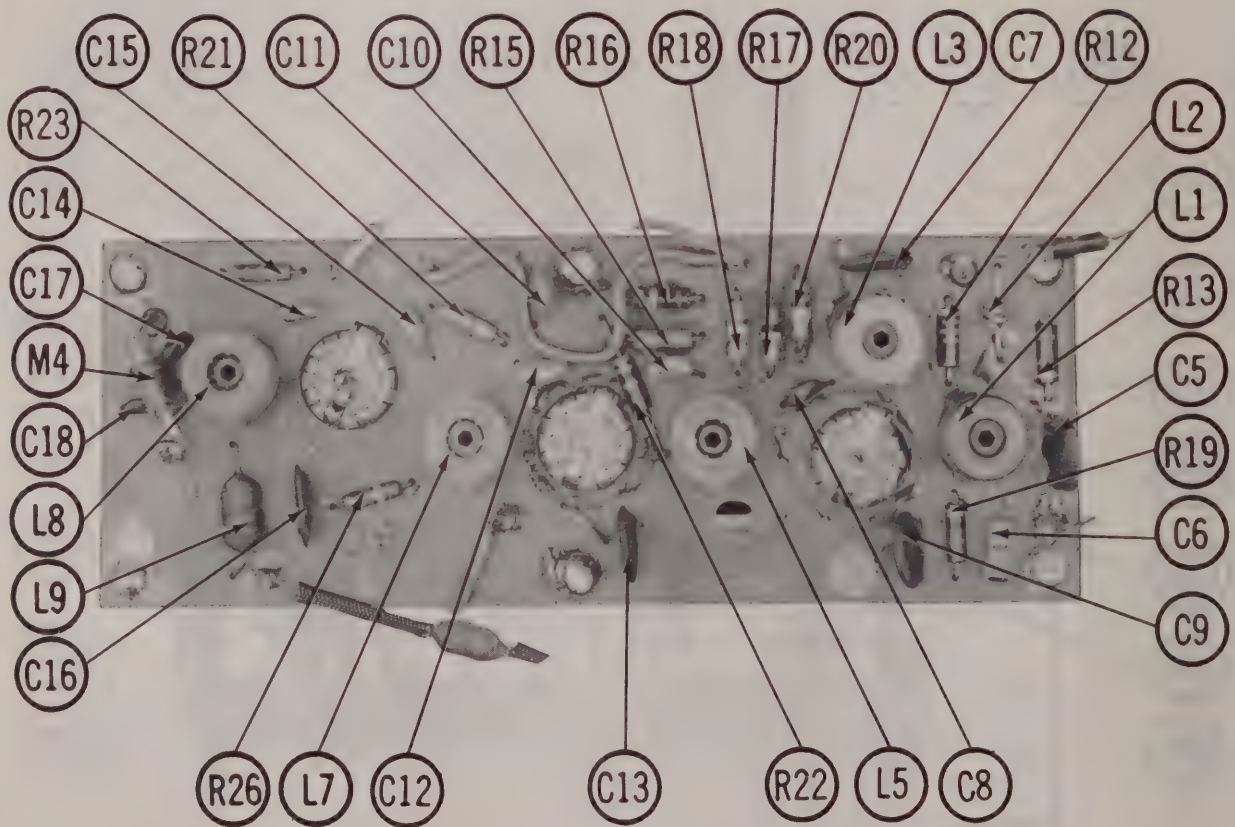
RF TUNER-LEFT SIDE



RF TUNER-RIGHT SIDE



RF TUNER-TOP VIEW



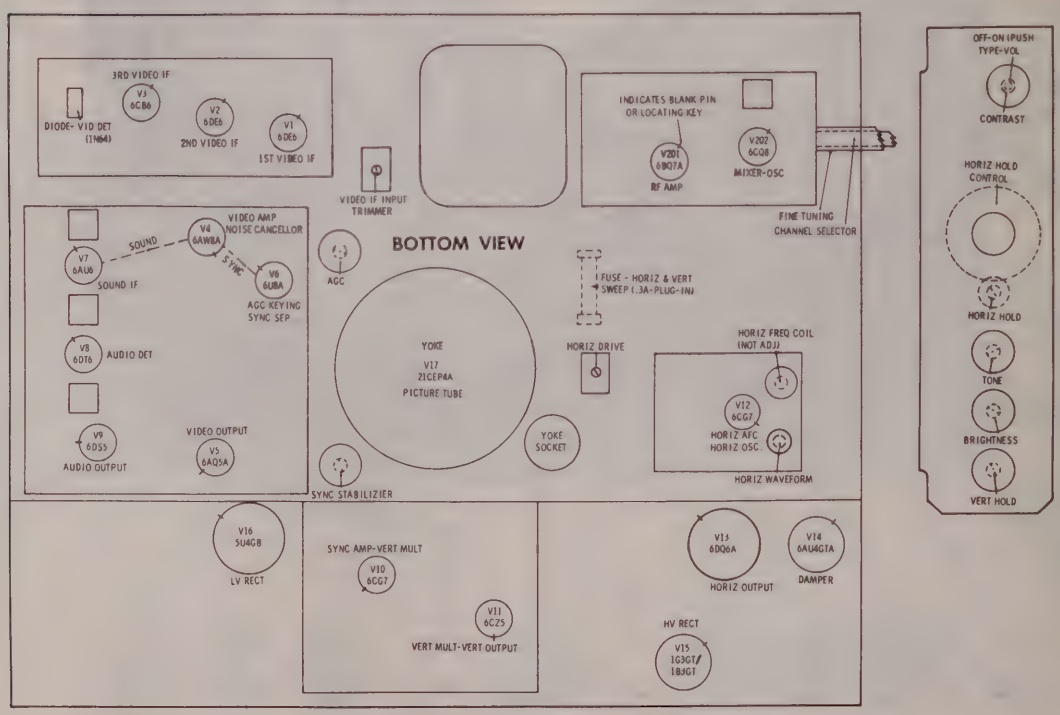
VIDEO IF—PRINTED BOARD

CHASSIS BOTTOM VIEW

RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6DE6	100K	56Ω	.1Ω	0Ω	▲ 820Ω	▲ 820Ω	0Ω		
V2	6DE6	80K	▲18Ω	.1Ω	0Ω	† 820Ω	† 820Ω	90K		
V3	6CB6	.1Ω	180Ω	.1Ω	0Ω	† 4700Ω	† 4700Ω	0Ω		
V4	6AW8A	2200Ω	230K	† 33K	.1Ω	0Ω	180Ω	4000Ω	† 5000Ω	† 10K
V5	6AQ5A	470K	• 780Ω	0Ω	.1Ω	† 3900Ω	† 600Ω	470K		
V6	6U8A	1.1meg	† 20K	† 270Ω	0Ω	.1Ω	350K	† 4700Ω	0Ω	2.2meg
V7	6AU6	47K	0Ω	0Ω	.1Ω	† 6000Ω	† 19K	82Ω		
V8	6DT6	4Ω	560Ω	.1Ω	0Ω	‡550K	† 18K	470K		
V9	6DS5	0Ω	270Ω	.1Ω	0Ω	† 3600Ω	† 3300Ω	0Ω		
V10	6CG7	† 17K	33K	0Ω	0Ω	.1Ω	• ‡1.8meg	• 2meg	0Ω	0Ω
V11	6CZ5	† 150Ω	NC	• 1.4meg	.1Ω	0Ω	•1.4meg	0Ω	NC	† 445Ω
V12	6CG7	† 0Ω	• 900K	•520K	0Ω	.1Ω	† 68K	• 60K	71Ω	0Ω
V13	6DQ6A	TP	0Ω	NC	† 6800Ω	580K	TP	.1Ω	100Ω	TOP CAP ‡15Ω
V14	6AU4GTA	NC	NC	¶3.5meg	NC	† 5.6Ω	NC	0Ω	.1Ω	
V15	1G3GT/ 1B3GT	PINS 1 THRU 8 HAVE INFINITE RESISTANCE								TOP CAP † 105Ω
V16	5U4GB	NC	¶ 20K	NC	25Ω	NC	23Ω	NC	¶20K	
V17	21CEP4	0Ω	470K	‡1.1meg	0Ω	NC	NC	• 190K	.1Ω	
V201	6BQ7A	† 1800Ω	500K	600K	0Ω	.1Ω	500K	570K	0Ω	0Ω
V202	6CQ8	† 900Ω	100K	INF	.1Ω	0Ω	INF	0Ω	INF	INF
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9

¶ THIS READING MAY VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC CAPACITOR CONNECTED IN THE ASSOCIATED CIRCUIT.
• THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
† MEASURED FROM 270V SOURCE.
‡ MEASURED FROM PIN 3 OF V14.
▲ MEASURED FROM PIN 7 OF V2.
NC NO CONNECTION.
TP TIE POINT.



TUBE PLACEMENT CHART

PHOTOFACT* Folder
*TRADE MARK
EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

SILVERTONE MODELS 7138, 7140, 7142(Ch. 528.46300, 301)

*****CORRECTION NOTICE*****

The IRC replacement listing for the brightness and volume control (Part #25-87) used in Silvertone Models 7138, 7140, 7142 (Ch. 528.46300, 528.46301) was listed in error. (Photofact Set 388 — Folder 1).

The exact duplicate unit is IRC Type QJ-1071.

The "Concentrikit" Equivalent which was listed in error should have been as follows:

Kit K-4

Base Elements & Shafts ..... B11-133, P1-220 (Panel)
B11-137, R2-300 (Rear)

Switch 76-1

PRODUCTION CHANGES
BULLETIN 210

TECH-MASTER MODELS 630-5, 630-5T

*****CORRECTION NOTICE*****

The IRC replacement listing for the contrast and volume control used in Tech-Master Models 630-5 and 630-5T was listed in error. (Photofact Set 388 — Folder 2).

The "Concentrikit" Equivalent which was listed in error should have been as follows:

Kit K-2

Base Elements & Shafts ..... B17-114, P1-118 (Panel)
B13-137X, R1-205 (Rear)

Switch 76-2

The IRC replacement listing for the vertical hold and horizontal hold control used in Tech-Master Models 630-5 and 630-5T was listed in error.

The "Concentrikit" Equivalent which was listed in error should have been as follows:

Kit K-2

Base Elements & Shafts ..... B11-138, P1-118 (Panel)
B11-123, R1-205 (Rear)

PRODUCTION CHANGES
BULLETIN 210

SILVERTONE MODELS 8111, 8113, 8151, 8153(Ch. 528.50150, 152, 153, 154, 155)

*****CORRECTION NOTICE*****

The tuner schematic given on page 8 of Photofact Set 389 — Folder 3 used in Silvertone Models 8111, 8113, 8151 and 8153 (Ch. 528.50150, 152, 153, 154, 155) should be listed to include the following tuner part numbers.

VHF TUNER PART #95-144-0

UHF TUNER PART #95-143-0

UHF-VHF TUNER PART #95-131-0

SET 400 FOLDER 5

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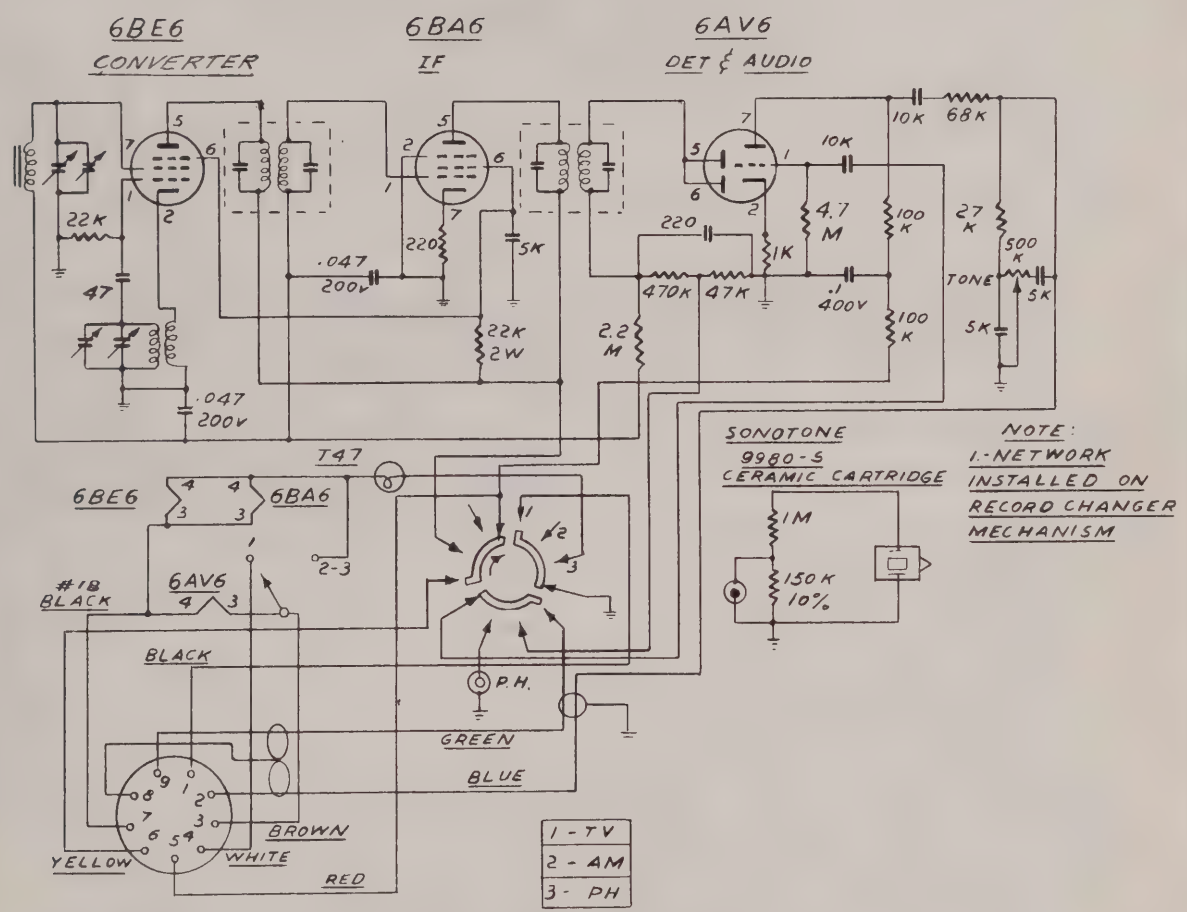
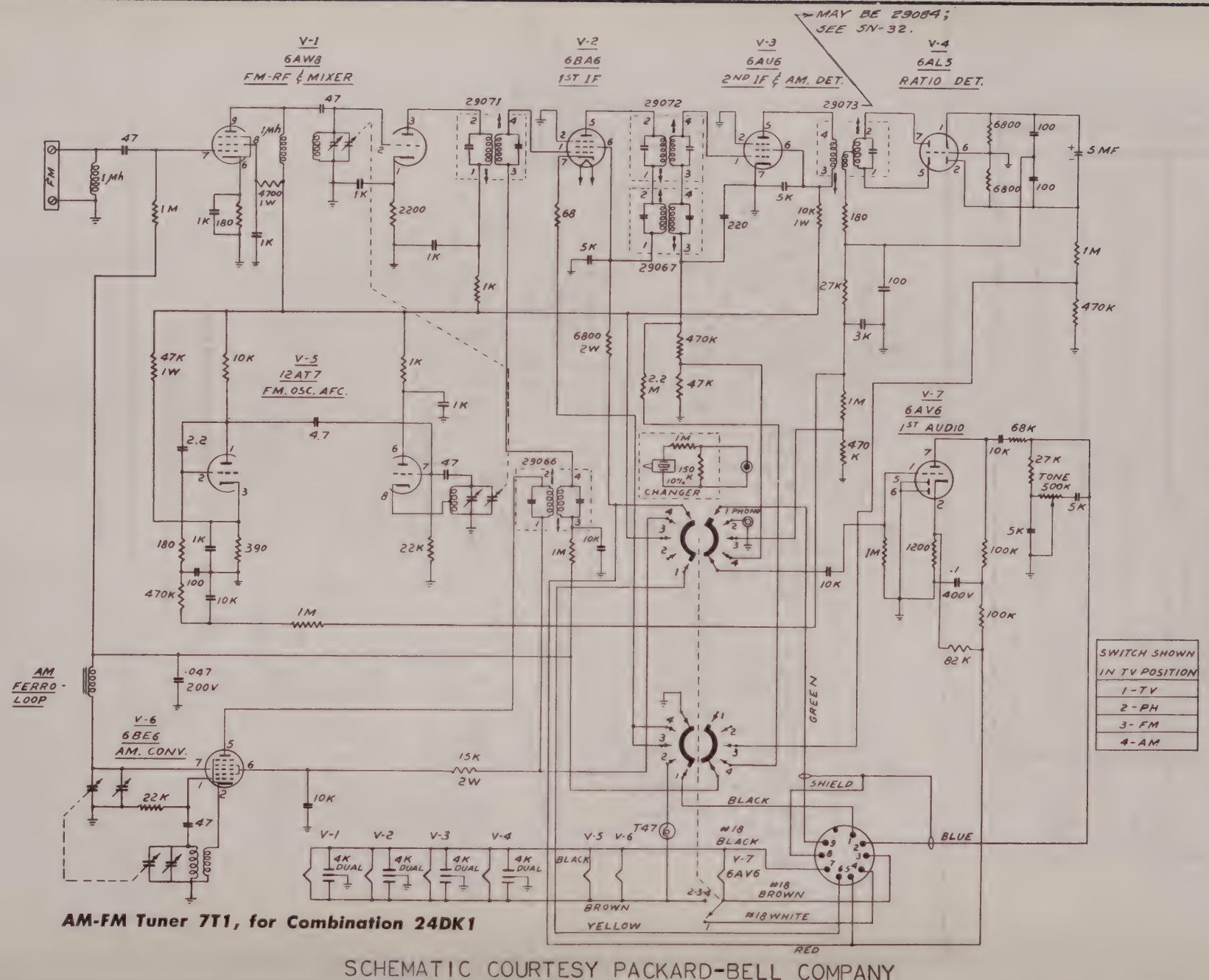
SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 9 IN SET 318	
	Packard-Bell Models 21DC1, 21DC1-U, 21DC2, 21DC2-U, 21DD1, 21DD1-U, 21DT1, 21DT1-U, 24DC1, 24DC1-U, 24DD1, 24DD1-U, 24DT1 and 24DT1-U(Ch. 98D1) were covered in Photofact Folder 9 — Set 318 and Production Changes Bulletin 189, Folder 1 — Set 367. Models 21DK1, 21DK1-U, 24DK1 and 24DK1-U (Ch. 98D1) are electrically identical to the models covered, except for the following changes.
21DK1, 21DK1-U	AM TUNER ADDED Models 21DK1 and 21DK1-U use AM Tuner 3T2. A schematic showing the AM Tuner is given in this bulletin.
24DK1, 24DK1-U	AM/FM TUNER ADDED Models 24DK1 and 24DK1-U use AM/FM Tuner 7T1. A schematic showing the AM/FM Tuner is given on the reverse side.



AM Tuner 3T2, for Combination 21DK1

SCHEMATIC COURTESY PACKARD-BELL COMPANY

(Continued on Reverse Side)



AM-FM Tuner 7T1, for Combination 24DK1

SCHEMATIC COURTESY PACKARD-BELL COMPANY

PHOTOFACT* Folder

CORONADO
MODEL RA48-8159A

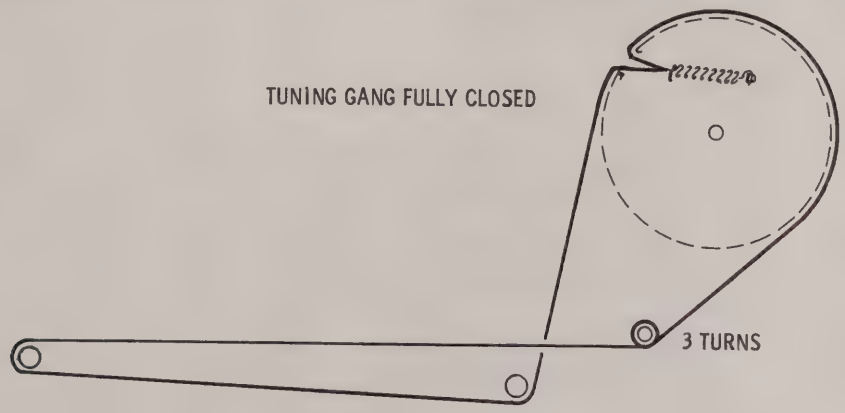
CORONADO
MODEL RA48-8159A

TRADE NAME	Coronado Model RA48-8159A
SUPPLIER	Gamble-Skogmo, Inc., 15N. 8th St., Minneapolis, Minn.
TYPE SET	AC-DC Operated AM Receiver
TUBES (Six)	Types 12BA6 RF Amplifier, 12BE6 Converter, 12BA6 IF Amplifier, 12AV6 Det.-AVC-AF Amp. 35C5 Output, 35W4 Rectifier
POWER SUPPLY	105-120 Volts AC-DC RATING .29 Amp. @117 Volts AC (29 Watts)
TUNING RANGE—BROADCAST	540KC-1650KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use isolation transformer, if available, if not, connect a .1MFD capacitor in series with low side of signal generator and B-. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.001mfd	High side to RF terminal (rear section) of tuning gang. Low side to B-.	456KC (400~ Mod.)	Tuning gang fully open.	Across Voice Coil	A1, A2 A3, A4	Adjust for maximum output.
2.		Loop	1600KC	1600KC	"	A5, A6	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		"	600KC	600KC	"	A7	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.



CORONADO
MODEL RA48-8159A

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H418

PARTS LIST AND DESCRIPTIONS

CORONADO
MODEL RA48-8159A

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	RF Amplifier	12BA6	
V2	Converter	12BE6	
V3	IF Amplifier	12BA6	
V4	Det. -AVC-AF Amp.	12AV6	
V5	Output	35C5	
V6	Rectifier	35W4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA CORONADO PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	70	150	150-140	PRS150V804020	BBRT84215	TCT3117	TDLT-7	FMT-339	R2423 *
B	50	150							
C	20	150							

*Non Catalog Item

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA CORONADO PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C2	270		156-101	BPD-00027	DD-271	L10T27	ED-270	UC-5327	5GA-T27	
C3	.05	200	152-104	P288N-05	DF-503	CUB2S5		GEM-415	2TM-S5	
C4	.05	200	152-104	P288N-05	DF-503	CUB2S5		GEM-415	2TM-S5	
C5	270		156-101	BPD-00027	DD-271	L10T27	ED-270	UC-5327	5GA-T27	①
C6	10000		158-102	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C7	.0047	600	152-110					GEM-16247		10%
C8	5000		158-101	BPD-005	DD-502	BYA10D5	ED-005	DC525	5HK-D5	
C9	5000		158-101	BPD-005	DD-502	BYA10D5	ED-005	DC525	5HK-D5	②
C10	.05	200	152-104	P288N-05	DF-503	CUB2S5		GEM-415	2TM-S5	
C11	.05	400	152-111	P488N-05	DF-503	CUB4S5		GEM-415	4TM-S5	
C12	.1	400	152-108	P488N-1	DF-104	CUB4P1		GEM-401	4TM-P1	

① Some versions may use 220mmf in this application (Part# 156-111)
② Some versions may use .0068mfd in this application (Part # 158-128)

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA CORONADO PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500K	1/2	120-128	F1-41				Tone
B	500K			R1-41				Volume
C	Switch			KB-1				On-Off

"Concentrikit" Equivalent; K-2Kit, Base Elements and Shafts: B13-133, P1-114 (Panel)
B13-133, R1-130 (Rear)
76-1 (Switch

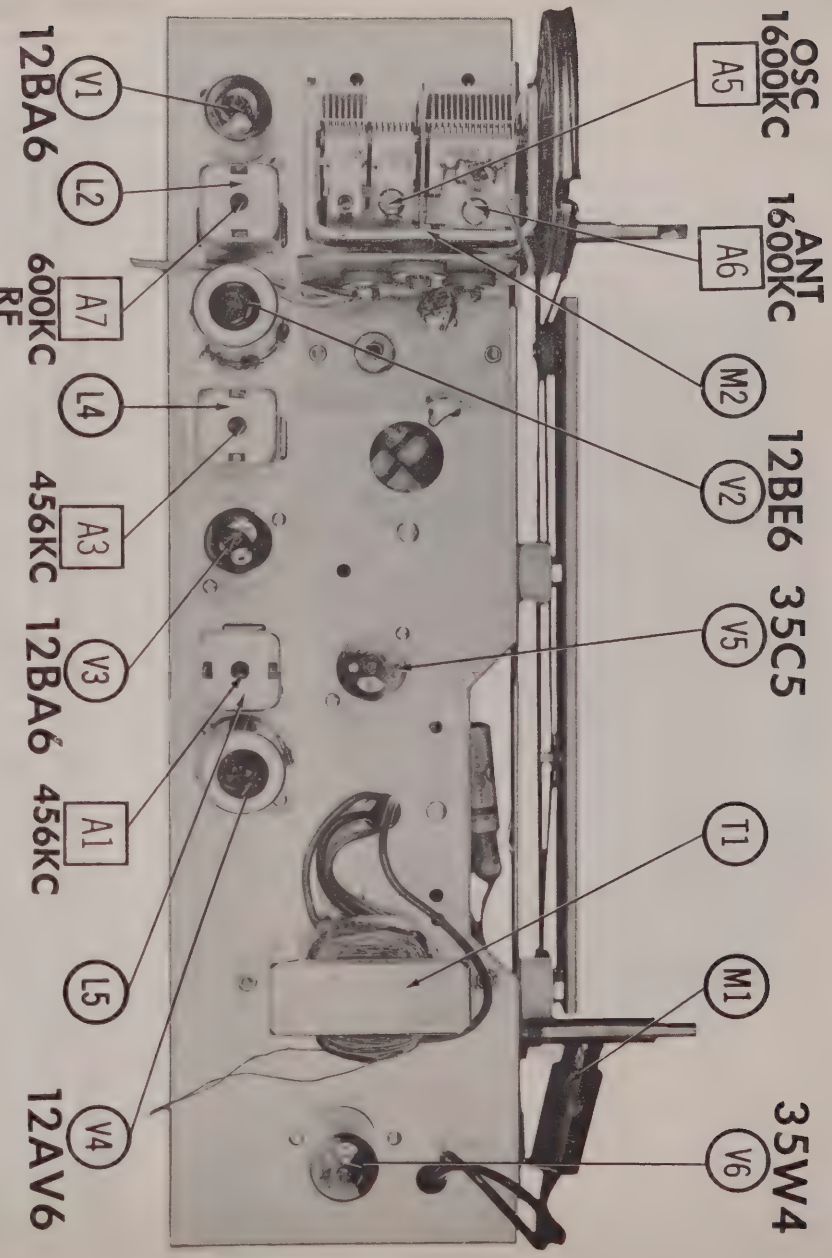
RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	CORONADO PART No.	NOTES
R2	2.2meg		180-107	
R3	47Ω			①
R4	18K			②
R5	1000Ω		180-106	
R6	82Ω		180-169	
R7	2.2meg		180-107	
R8	560Ω 5%		180-178	
R9	6.8meg		180-135	
R10	150Ω		180-111	
R11	4700Ω		180-183	
R12	1800Ω			③
R13	15K		180-115	
R14	1000Ω	1	180-184	
R15	220Ω			④

①Some versions may use 56 Ω in this application (Part # 180-173)
②Some versions may use 22K in this application (Part# 180-102)
③ Some versions may use 2200Ω in this application (Part# 180-101)
④Not used in some versions

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.1	REPLACEMENT DATA CORONADO PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	2700Ω	3-4Ω	138-124							
	TURNS RATIO PRI.	SEC2								
	3.5:	1								

SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	REPLACEMENT DATA CORONADO PART No.	REPLACEMENT DATA QUAM PART No.	NOTES
SP1	6 1/2"	PM	3-4Ω	175-126	6A31	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA CORONADO PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1	Loop Ant.	134-109A					Includes Cabinet Back & Line Cord
L2	RF Trans.	130-113					
L3	Osc. Coil	136-131	14-1073	BC-393*	69-Osc*		
L4	Input IF	130-114	16-6758	BC-352	12-C1	RF-1	
L5	Output IF	130-107	16-6758	BC-353	12-C2	RF-2	

*Drill New Mounting Hole

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	CORONADO PART No.	REPLACEMENT DATA	
K1	Audio Coup. Net.	5000mmf, 250mmf 250K, 500K,		Aerovox	PA-112-2
				Centralab	PC-71
				Cornell-Dubilier	112TM2
				Erie	1406-02
				Sprague	T-4

MISCELLANEOUS

ITEM No.	PART NAME	CORONADO PART No.	NOTES
M1	Dial Lamp		#47
M2	Tuning Cap.	160-120	3Gang (Ant. 21-465mmf, RF9-210mmf, Osc. 20-128mmf)

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

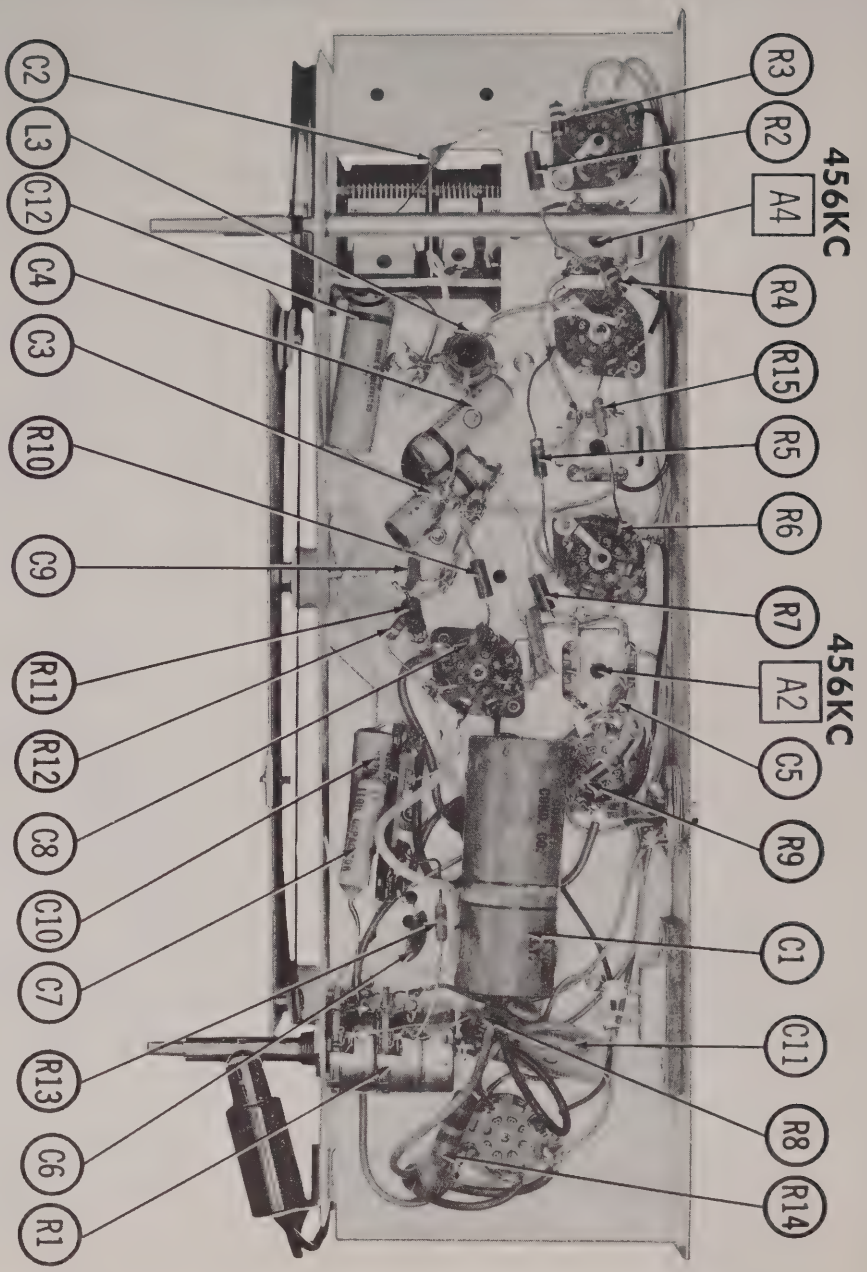
NAME	PART NO.	DESCRIPTION
Knob	220-148	Tuning
Knob	220-147	On-Off-Volume
Knob	220-129A	Tone
Cabinet	210-140	Complete

WIRING DATA

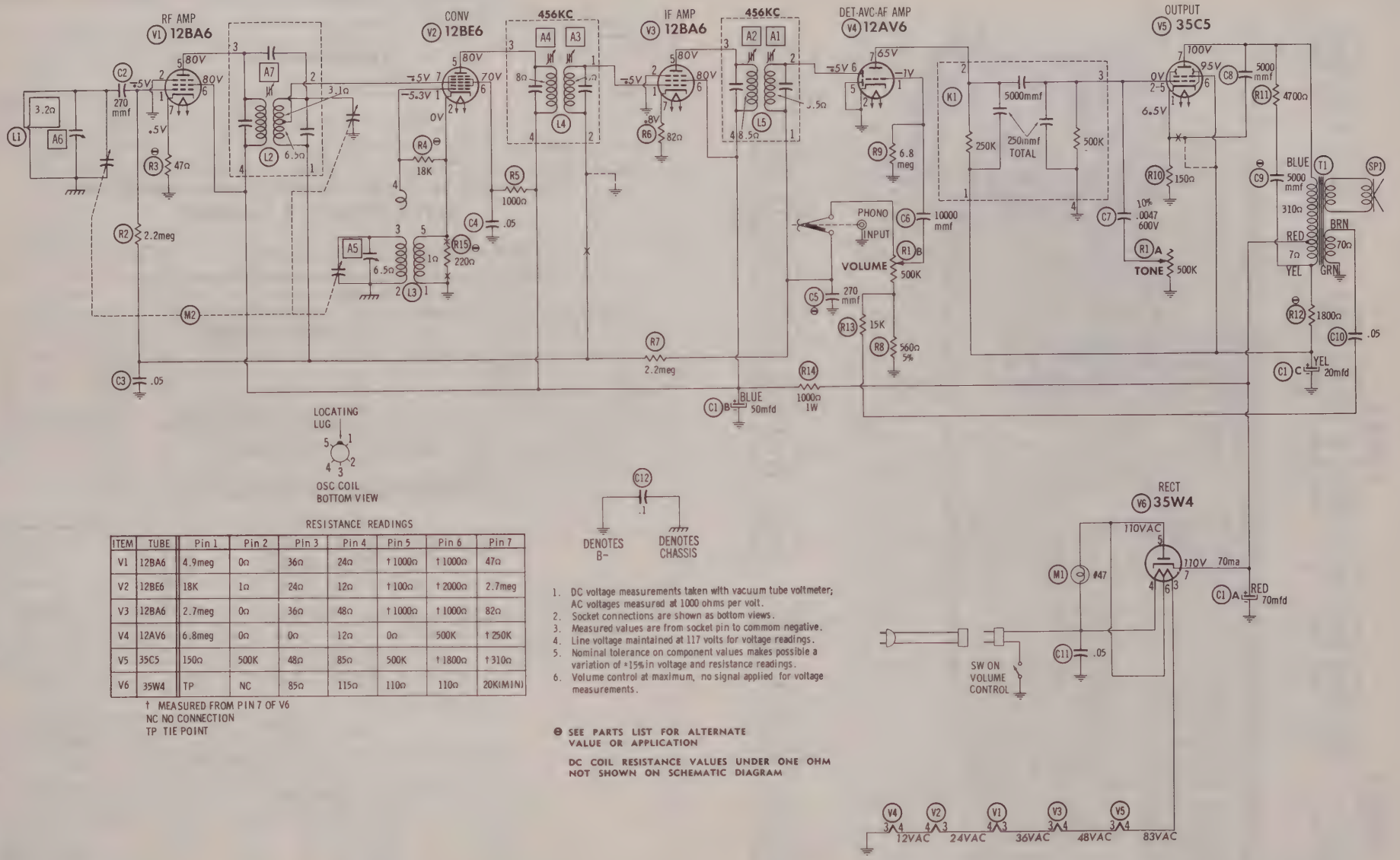
General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord (Interlock Type) ..... Use BELDEN No. 8874

CHASSIS—BOTTOM VIEW



CORONADO
MODEL RA48-8159A



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	12BA6	4.9meg	0Ω	36Ω	24Ω	†1000Ω	†1000Ω	47Ω
V2	12BE6	18K	1Ω	24Ω	12Ω	†100Ω	†2000Ω	2.7meg
V3	12BA6	2.7meg	0Ω	36Ω	48Ω	†1000Ω	†1000Ω	82Ω
V4	12AV6	6.8meg	0Ω	0Ω	12Ω	0Ω	500K	†250K
V5	35C5	150Ω	500K	48Ω	85Ω	500K	†1800Ω	†310Ω
V6	35W4	TP	NC	85Ω	115Ω	110Ω	110Ω	20K(MIN)

† MEASURED FROM PIN 7 OF V6
NC NO CONNECTION
TP TIE POINT

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to commom negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

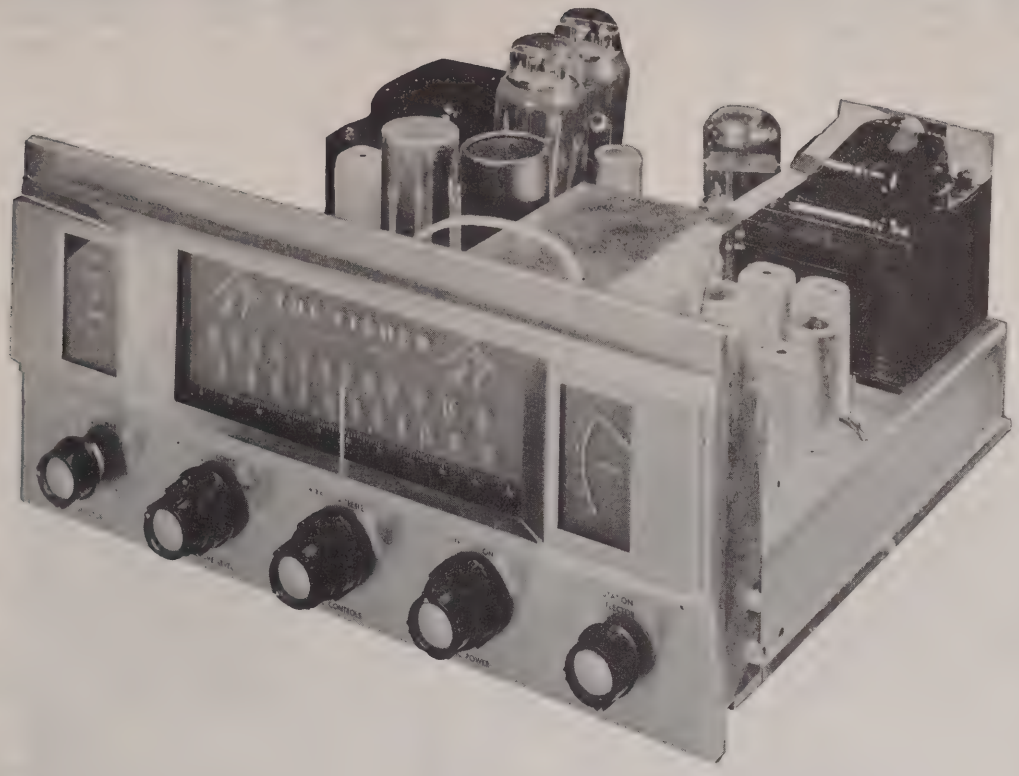
DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

PHOTOFACT* Folder

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

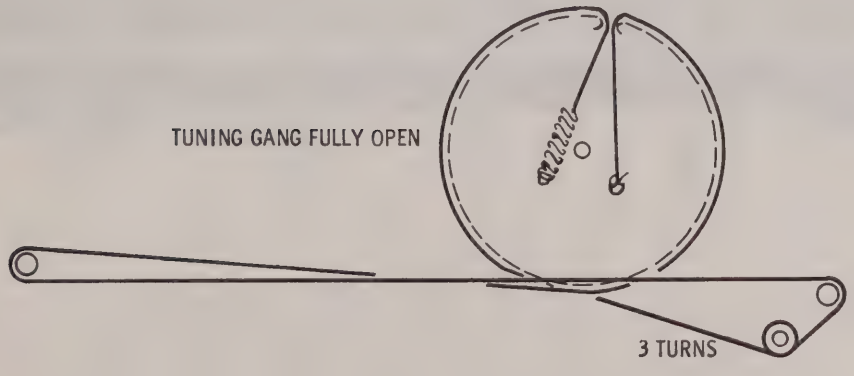
FISHER MODEL 500

FISHER MODEL 500



FISHER MODEL 500

TRADE NAME	Fisher Model 500	
MANUFACTURER	Fisher Radio Corp., 21-21 44th. Drive, Long Island City 1, N.Y.	
TYPE SET	AC Operated FM-AM Receiver	
TUBES	Fourteen	
POWER SUPPLY	105-125 Volts AC 50/60 Cycles	RATING 1.4 Amp. @ 117 Volts AC (160 Watts)
TUNING RANGE-BROADCAST	550-1600KC	FREQ. MOD. 88-108MC



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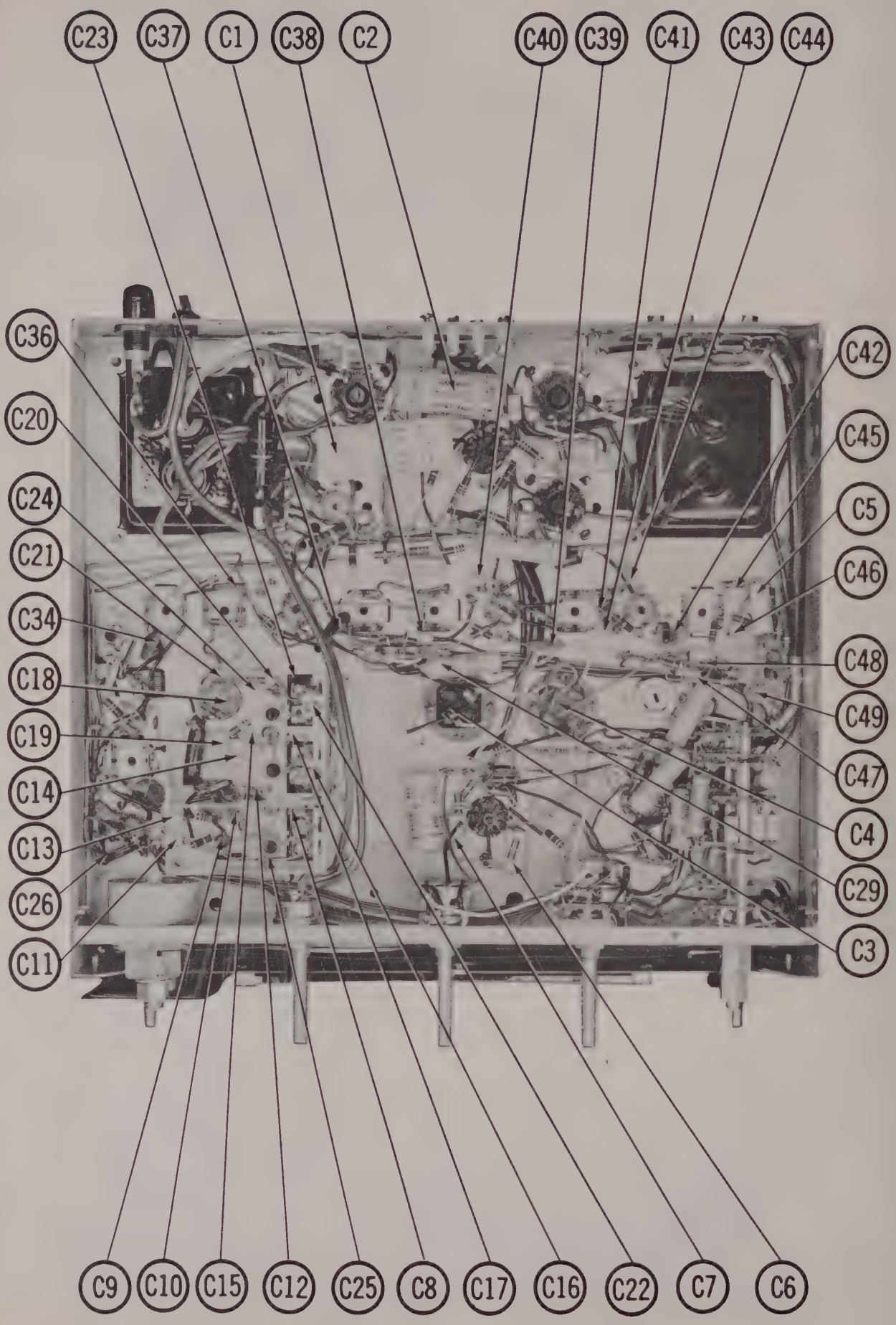
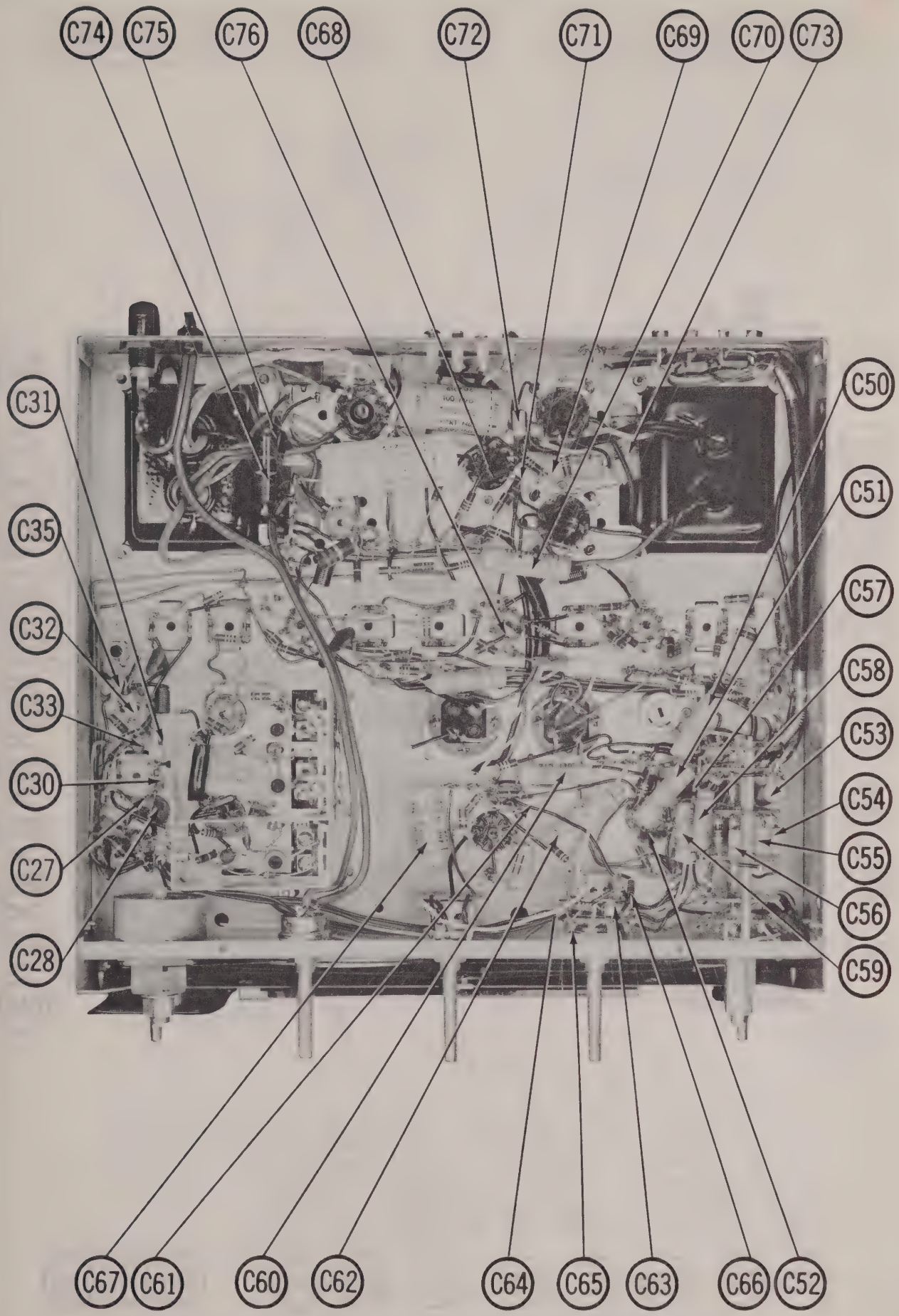
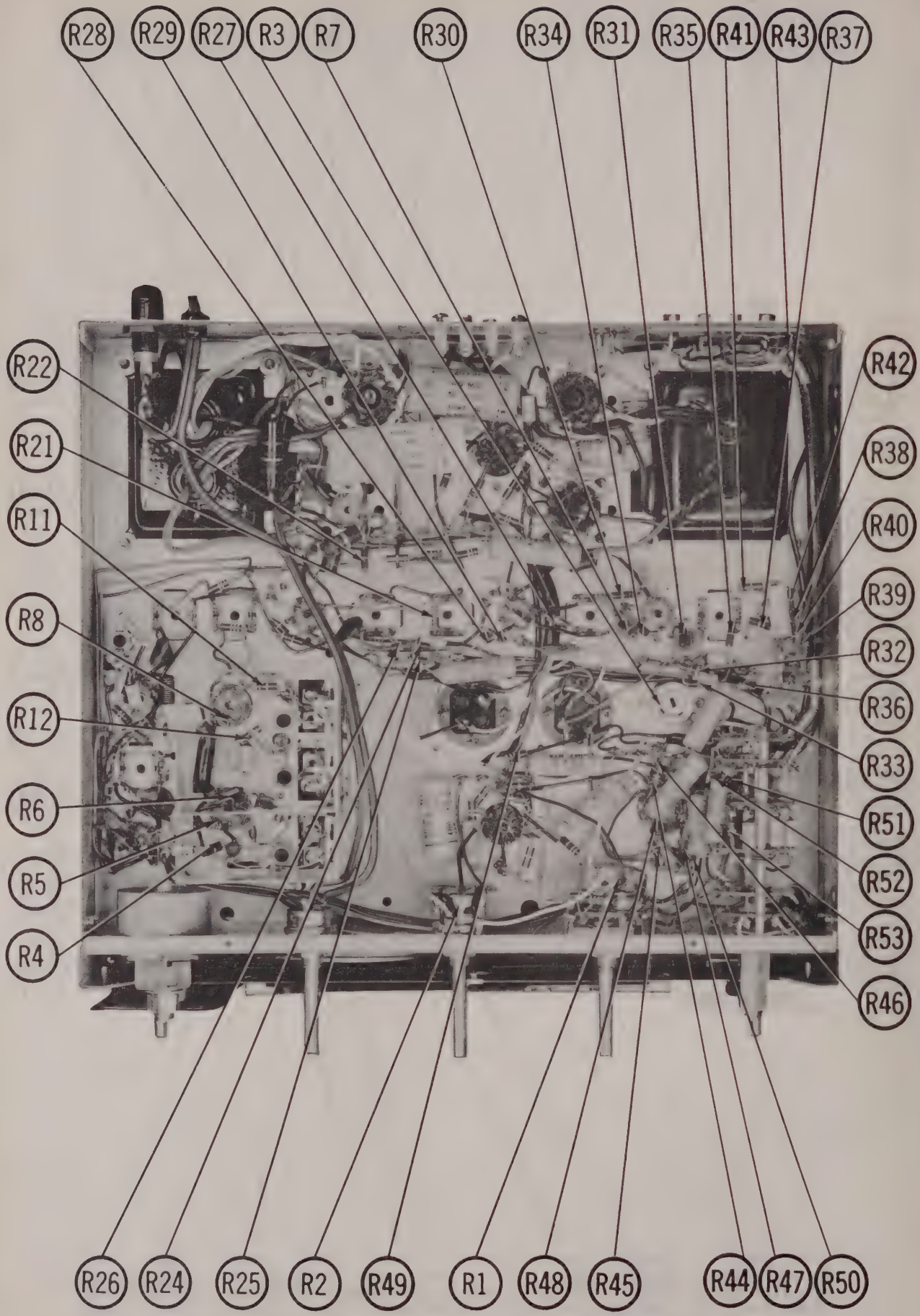


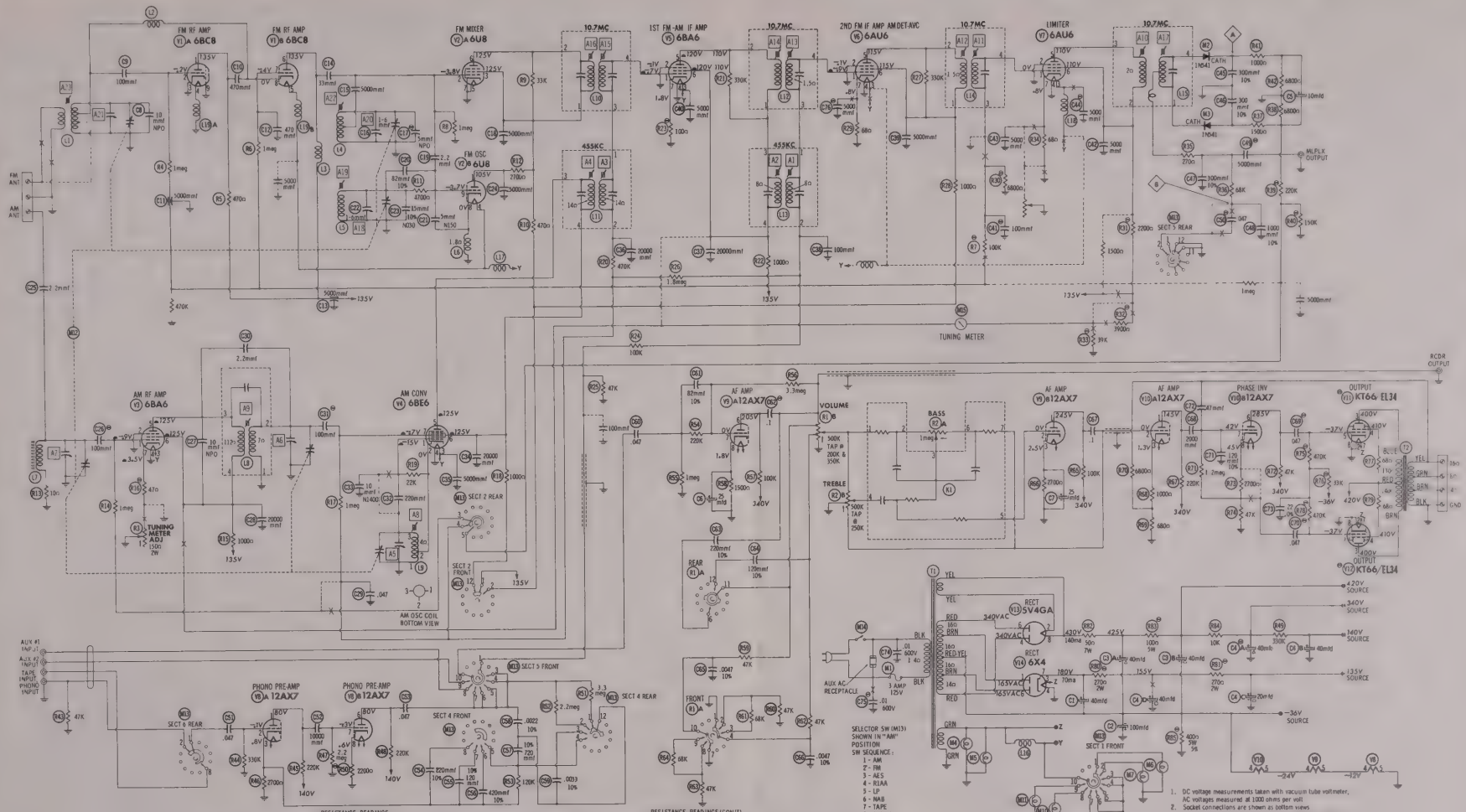
CHASSIS-BOTTOM VIEW-CAPACITOR IDENTIFICATION



CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION



CHASSIS-BOTTOM VIEW-RESISTOR IDENTIFICATION



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6BC8	*1000Ω	1.1meg	0Ω	1Ω	1Ω	*540Ω	1.1meg	.1Ω	0Ω
V2	6U8	*370Ω	1meg	*1000Ω	.1Ω	0Ω	*1000Ω	0Ω	1.8Ω	4700Ω
V3	6BA6	≈2.9meg	0Ω	.1Ω	0Ω	≈*1500Ω	≈*1500Ω	270Ω		
V4	6BE6	22K	5Ω	.1Ω	0Ω	≈*1500Ω	≈*1500Ω	≈2.9meg		
V5	6BA6	2.3meg	0Ω	0Ω	.1Ω	*1500Ω	*1500Ω	100Ω		
V6	6AU6	150K	0Ω	.1Ω	0Ω	*1500Ω	*1500Ω	68Ω		
V7	6AU6	6800Ω	0Ω	.1Ω	0Ω	*2700Ω	*2700Ω	68Ω		

RESISTANCE READINGS (CON'T)

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V8	12AX7	†350K	330K	2700Ω	12Ω	0Ω	†350K	2.2meg	2200Ω	6Ω
V9	12AX7	†110K	440K	2700Ω	24Ω	12Ω	†110K	900K	1500Ω	18Ω
V10	12AX7	†250K	230K	1600Ω	36Ω	24Ω	†57K	1.2meg	49K	30Ω
V11	KT66 EL34	NC	0Ω	†280Ω	†220Ω	470K	TP	.1Ω	0Ω	
V12	KT66 EL34	TP	0Ω	†290Ω	†220Ω	470K	TP	.1Ω	0Ω	
V13	5V4GA	NC	20K(MIN)	TP	64Ω	NC	66Ω	NC	20K(MIN)	
V14	6X4	52Ω	TP	.1Ω	0Ω	NC	52Ω	20K(MIN)		

ALL MEASUREMENTS TAKEN IN "FM" POSITION UNLESS OTHERWISE DESIGNATED

* MEASURED FROM PIN 7 OF V14
† MEASURED FROM PIN 8 OF V13
≈ MEASURED IN "AM" POSITION
NC NO CONNECTION
TP TIE POINT

1. DC voltage measurements taken with vacuum tube voltmeter, AC voltages measured at 1000 ohms per volt
2. Socket connections are shown as bottom views
3. Measured values are from socket pin to common negative
4. Line voltage maintained at 117 volts for voltage readings
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings
6. Volume control at maximum, no signal applied for voltage measurements.

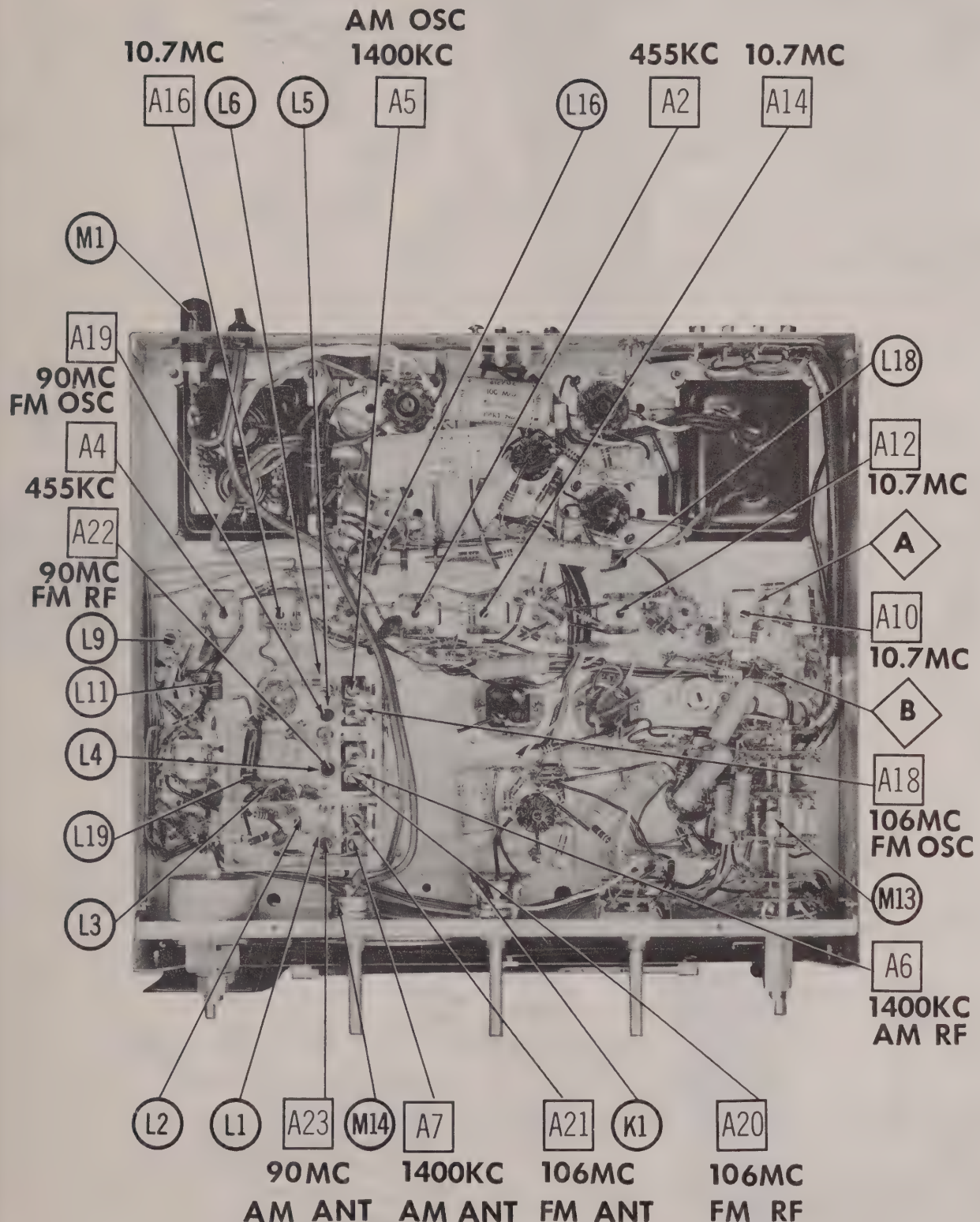
● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER OHM NOT SHOWN ON SCHEMATIC DIAGRAM.

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1958

400-7



CHASSIS BOTTOM VIEW—ALIGN., INDUCTOR, MISC. IDENT.

ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

AM ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.01mfd	High side to pin 7 (grid) of 6BE6 (V4). Low side to chassis.	455KC	AM	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output.
2.	200mmf	High side to AM antenna terminal. Low side to chassis.	1400KC	"	1400KC	"	A5, A6, A7	"
3.	200mmf	"	600KC	"	600KC	"	A8, A9	Adjust for maximum output. Repeat steps 2 and 3.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
4.	Direct	High side to ungrounded tube shield on 6U8 (V2). Low side to chassis.	10.7MC (Unmod)	FM	Point of non-interference	DC probe to point (A). Common to chassis.	A10, A11, A12, A13, A14, A15, A16	Adjust for maximum deflection.
5.	"	"	"	"	"	DC probe to point (B). Common to chassis.	A17	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60~ modulation and 450KC sweep. Use 120~ sawtooth volage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
4.	Direct	High side to ungrounded tube shield on 6U8 (V2). Low side to chassis.	10.7MC (450KC Swp)	FM	Point of non-interference	Vert. Amp. to point (A). Low side to chassis.	A10, A11, A12, A13, A14, A15, A16	Disconnect stabilizing capacitor (C5). Adjust for curve of maximum amplitude and symmetry as in Fig. 1.
5.	"	"	"	"	"	Vert. Amp. to point (B). Low side to chassis.	A17	Reconnect capacitor (C5). Adjust A17 so that 10.7MC occurs at center of crossover lines as in Fig. 2. SLIGHTLY retouch A10 for maximum amplitude and straightness of crossover lines.

FM RF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
6.	270Ω Carbon Resistor	High side to FM antenna terminal. Low side to chassis.	106MC (45KC Swp)	FM	106MC	DC probe to point (A). Common to chassis.	A18	Adjust for maximum deflection.
7.	"	"	90MC	"	90MC	"	A19	"
8.	"	"	106MC	"	106MC	"	A20, A21	"
9.	"	"	90MC	"	90MC	"	A22, A23	Adjust for maximum deflection. Repeat steps 6, 7, 8 and 9 until no further improvement is obtained.

FIG. 1

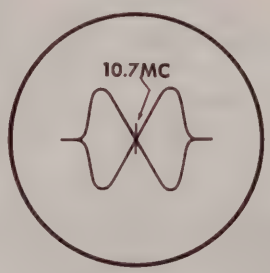
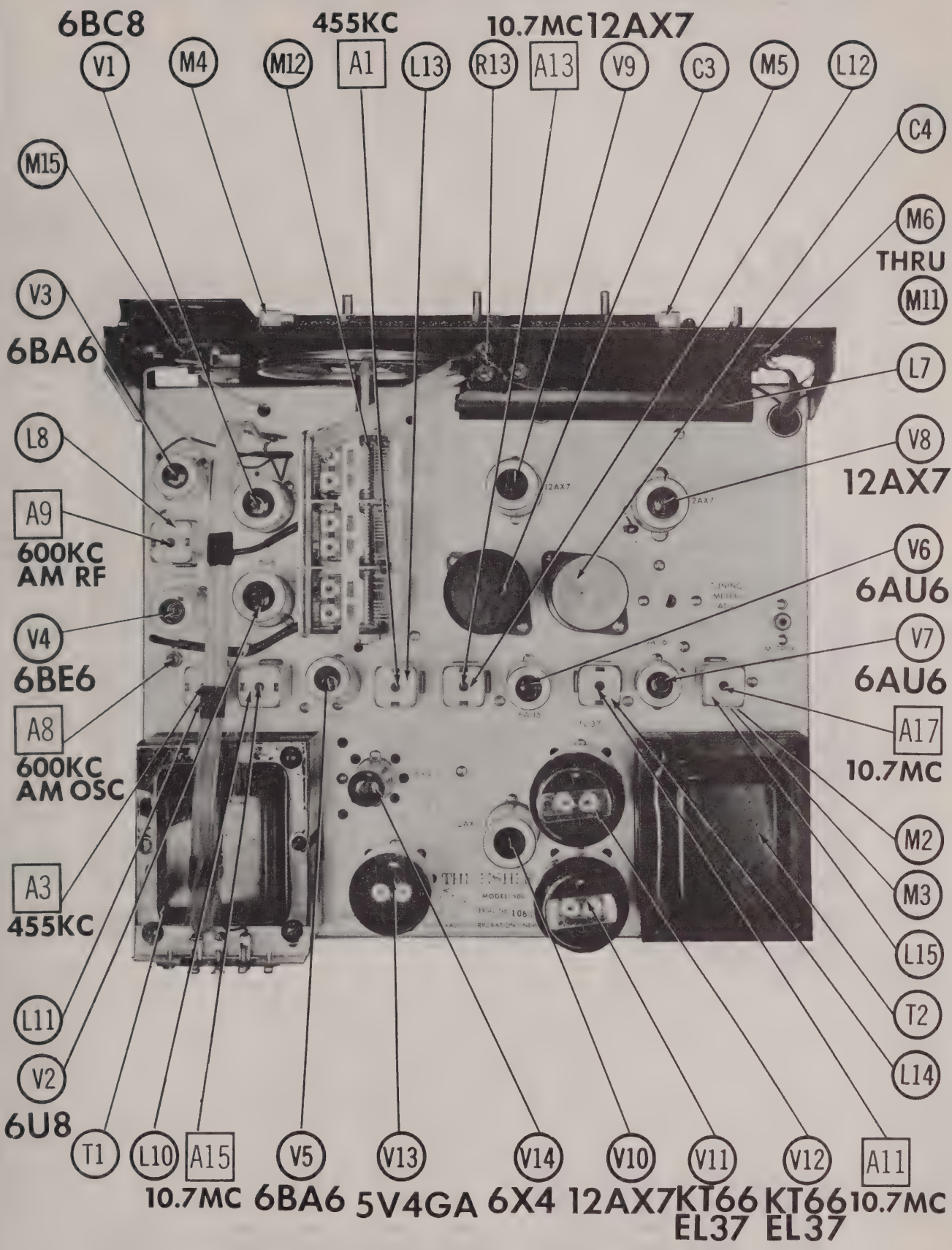
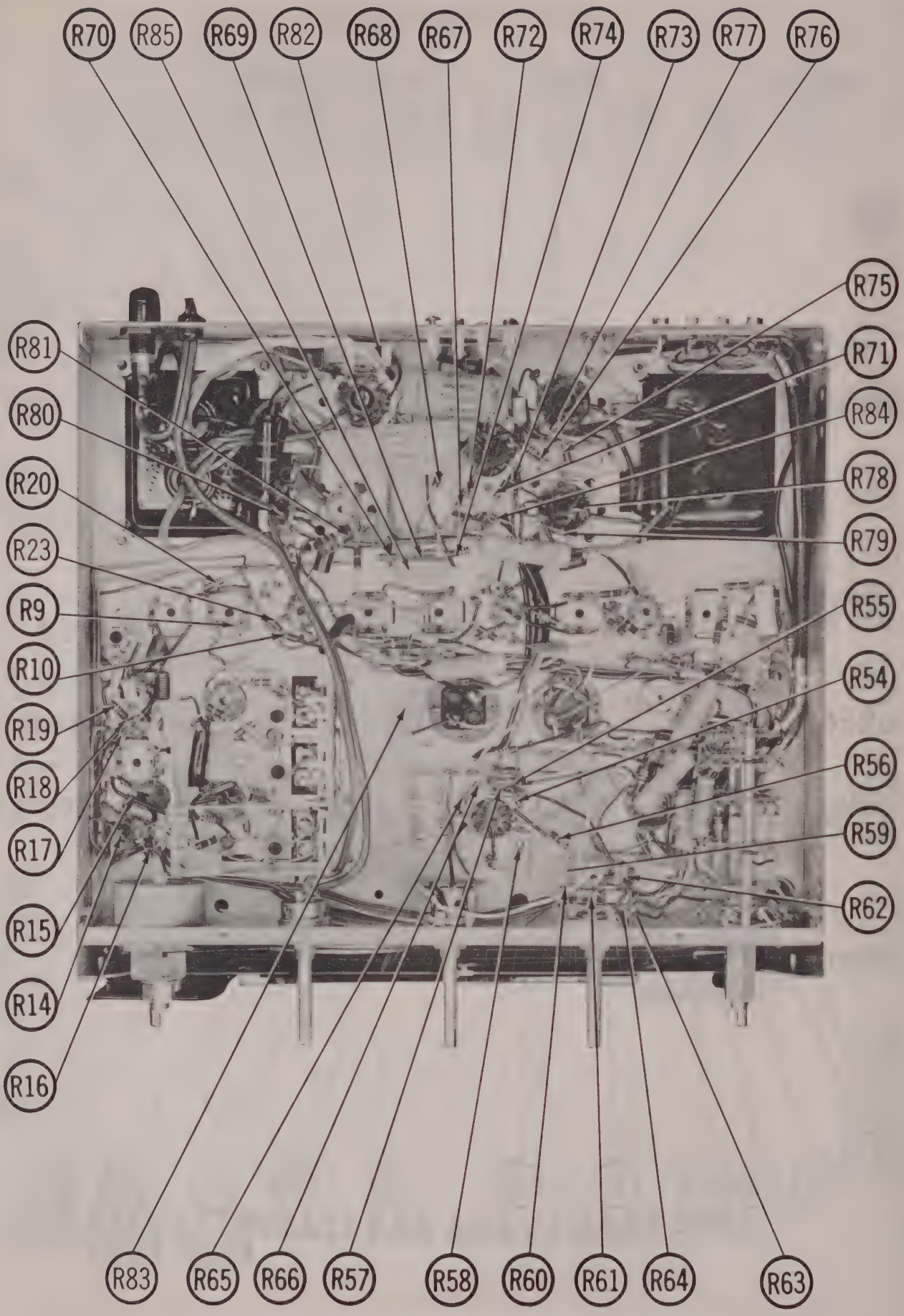


FIG. 2



CHASSIS TOP VIEW



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	FM RF Amplifier	6BC8	
V2	FM Mixer-FM Osc.	6U8	
V3	AM RF Amplifier	6BA6	
V4	AM Converter	6BE6	
V5	1st. FM-AM IF Amplifier	6BA6	
V6	2nd. FM IF Amp. - AM Det. -AVC	6AU6	
V7	Limiter	6AU6	

ITEM No.	USE	TYPE	NOTES
V8	Phono Preamplifier	12AX7	
V9	AF Amplifier	12AX7	
V10	AF Amp. -Phase Inv.	12AX7	
V11	Output	KT66/EL34	Note 1
V12	Output	KT66/EL34	Note 1
V13	Rectifier	5V4GA	
V14	Rectifier	6X4	

Note 1. Alternate type 5881.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA FISHER PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1	40	250	C-592-151	PRS250V40	BR4025	TC58	TD-40-250	MT-2540	TVA-1511
C2	100	50	C-592-150	PRS50V100	BR1005	TC3501	TD-100-50	MTH-5010	TVA-1310
C3A	▲40	500	C-592-146	AFH2-72	B0530	FP288	TMD-62	D-275	TVL-2940
B	▬40	500							
C4A	▲40	250	C-592-191 ①	AFH4-18-45	C0350	FP377	TMT-40	T-170	R2602 *
B	40	250			BR2035	TC65	TD-20-350	MT-4520	
C	▲40	450							
D	■20	350							
C5	10	50	C-551-146	PWE50010	BBR10-50	TC32	TD-10-50	MT-0510	TVA-1304
C6	25	6	C-556-137	PWE6025	BBR25-6	TT6X25	ML30-6	MMT-625	TE-1091
C7	25	6	C-556-137	PWE6025	BBR25-6	TT6X25	ML30-6	MMT-625	TE-1091

① Part #C-592-147 (less C4D) used in some versions.
* Non Catalog Item

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA FISHER PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C8	10		CC20CH100G5	NPO-SI 10	TCZ-10	CTA6Q1C	TCO-10	ZT-541	5TCC-Q1	NPO
C9	100		C-577-121	BPD-0001	DD-101	L10T1	ED-100	UC-531	5GA-T1	
C10	470		C-520-143	BPD-00047	DD-471	BYA10T47	ED-470	UC-5347	5GA-T47	
C11	5000		CK62GP502V6							
C12	470		C-520-143	BPD-00047	DD-471	BYA10T47	ED-470	UC-5347	5GA-T47	
C13	5000		CK62GP502V6							
C14	33		CC21GP330M5	SI 33	D6-330	LT6Q33	GP-33	UC-5433	5GA-Q33	
C15	5000		CK62GP502V6	BPD-005	DD-502	BYA10D5	ED-005	DC525	5HK-D5	
C16	1-6		C-520-159		829-6		532-B			
C17	5			NPO-SI 5	TCZ-4R7	C10V5C	TCO-5	ZT-555	5TCCB-V5	NPO①
C18	5000		CK62GP502V6	BPD-005	DD-502	BYA10D5	ED-005	DC525	5HK-D5	
C19	2.2		C-3039	NPO-SI 2.2	TCZ-2R2	CTA6V22C	TCO-2.2		5TCCB-V22	
C20	82		CC21GP820K5		D6-820	L10Q82	ED-82		MS-482	10%
C21	5		CC20PH050F5							N150
C22	1-6		C-520-159		829-6		532-B			
C23	15		CC20HG150K5							N030 10%
C24	5000		CK62GP502V6	BPD-005	DD-502	BYA10D5	ED-005	DC525	5HK-D5	
C25	2.2		C-3039	NPO-SI 2.2	TCZ-2R2	CTA6V22C	TCO-2.2		5TCCB-V22	
C26	100		C-577-121	BPD-0001	DD-101	L10T1	ED-100	UC-531	5GA-T1	②
C27	10		CC20CH100G5	NPO-SI 10	TCZ-10	CTA6Q1C	TCO-10	ZT-541	5TCC-Q1	NPO
C28	20000		C-556-122	BPD-02	DD-203	BYB6S2	ED-02		5HK-S2	
C29	.047	200	C68P473M2	P288N-047	DF-503	CUB4S47		GEM-4147	2TM-S47	
C30	2.2		C-3039	NPO-SI 2.2	TCZ-2R2	CTA6V22C	TCO-2.2		5TCCB-V22	
C31	100		C-577-121	BPD-0001	DD-101	L10T1	ED-100	UC-531	5GA-T1	②
C32	220		CC21GP221M5	SI 220	D6-221	LT6T22	GP-220	UC-5322	5GA-T22	
C33	10		CC20VK100G5							N1400
C34	20000		C-556-122	BPD-02	DD-203	BYB6S2	ED-02		5HK-S2	
C35	5000		CK62GP502V6	BPD-005	DD-502	BYA10D5	ED-005	DC525	5HK-D5	
C36	20000		C-556-122	BPD-02	DD-203	BYB6S2	ED-02		5HK-S2	
C37	20000		C-556-122	BPD-02	DD-203	BYB6S2	ED-02		5HK-S2	
C38	100		CC21GP101M5	SI 100	D6-101	LT6T1	GP-100	UC-531	5GA-T1	
C39	5000		CK62GP502V6	BPD-005	DD-502	BYA10D5	ED-005	DC525	5HK-D5	
C40	5000		CK62GP502V6	BPD-005	DD-502	BYA10D5	ED-005	DC525	5HK-D5	
C41	100		C-577-121	BPD-0001	DD-101	L10T1	ED-100	UC-531	5GA-T1	③

PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (cont)

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA FISHER PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C42	5000		CK62GP502V6	BPD-005	DD-502	BYA10D5	ED-005	DC525	5HK-D5	
C43	5000		CK62GP502V6	BPD-005	DD-502	BYA10D5	ED-005	DC525	5HK-D5	
C44	5000		CK62GP502V6	BPD-005	DD-502	BYA10D5	ED-005	DC525	5HK-D5	③
C45	300		CC21GP301K5		D6-301	L10T3	ED-300	MCB241	MS-33	10%
C46	300		CC21GP301K5		D6-301	L10T3	ED-300	MCB241	MS-33	10%
C47	300		CC21GP301K5		D6-301	L10T3	ED-300	MCB241	MS-33	10%
C48	1000		CC26GP102K5			1R5D1	ED-1000	MCB255	MS-21	10%
C49	5000		CK62GP502V6	BPD-005	DD-502	BYA10D5	ED-005	DC525	5HK-D5	④
C50	.047	200	C68P473M2	P288N-047	DF-503	CUB2S47		GEM-4147	2TM-S47	③
C51	.047	200	C68P473M2	P288N-047	DF-503	CUB2S47		GEM-4147	2TM-S47	
C52	10000		CK62GP103V6	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C53	.047	400	C68P473M4	P488N-047	DF-503	CUB4S47		GEM-4147	4TM-S47	
C54	220		CC21GP221K5		D6-221	L10T22	ED-220		MS-322	10%
C55	120		CC21GP121K5		D6-121	L10T12	ED-120		MS-312	10%
C56	420		CC21GP421K5							10%
C57	720		CC21GP721K5							10%
C58	.0022	200	C68P222K2							10%
C59	.0033	200	C68P332K2					GEM-16233		10%
C60	.047	200	C68P473M2	P288N-047	DF-503	CUB2S47		GEM-4147	2TM-S47	
C61	82		CC21GP820K5		D6-820	L10Q82	ED-82		MS-482	10%
C62	.1	400	C68P104M4	P488N-1	DF-104	CUB4P1		GEM-401	4TM-P1	⑤
C63	220		CC21GP221K5		D6-221	L10T22	ED-220		MS-322	10%
C64	120		CC21GP121K5		D6-121	L10T12	ED-120		MS-312	10%
C65	.0047	200	C68P472K2					GEM-16247		10%
C66	.0047	200	C68P472K2					GEM-16247		10%
C67	.1	400	C68P104M4	P488N-1	DF-104	CUB4P1		GEM-401	4TM-P1	
C68	20000		C-556-122	BPD-02	DD-203	BYB6S2	ED-02		5HK-S2	
C69	.047	400	C68P473M4	P488N-047	DF-503	CUB4S47		GEM-4147	4TM-S47	⑥
C70	.047	400	C68P473M4	P488N-047	DF-503	CUB4S47		GEM-4147	4TM-S47	⑥
C71	120		CC21GP121K5		D6-121	L10T12	ED-120		MS-312	10%
C72	47		CC21GP470M5	SI 47	D6-470	LT6Q47	GP-47	UC-5447	5GA-Q47	
C73	.22	200	C68P224V2					GEM-2022		10%
C74	.01	600	C-2747	P688N-01	D6-103	CUB6S1	GP-10000	GEM-611	6TM-S1	
C75	.01	600	C-2747	P688N-01	D6-103	CUB6S1	GP-10000	GEM-611	6TM-S1	③
C76	5000		CK62GP502V6	BPD-005	DD-502	BYA10D5	ED-005	DC525	5HK-D5	③

① Some versions use 10mmf NPO in this application (Part #CC20CH100G5).
② Some versions use 220mmf in this application (Part #CC21GP221M5).
③ Not used in some versions.
④ Some versions use 20000mmf in this application (Part #C-556-122).
⑤ Some versions use .22mfd 400V in this application (Part #C69P224V4).
⑥ Some versions use .1mfd 400V in this application (Part #C68P104M4).

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA FISHER PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	Switch		R-592-178					Loudness Contour
B	500K	½						Volume, Tap ⓐ 200K & 350K
R2A	1meg	½	R-592-179			QJ-954R①		Bass
B	500K	½						Treble, Tap ⓐ 250K
R3	150Ω	2	R-550-135-2		39-150		FL-150	Tuning Meter Adj.

♦ "Concentrikit" Equivalent ; K-6 Kit, Base Elements & Shafts: B11-137, P14-121 (Panel) B19-133X, R1-130 (Rear)

① Not available as a factory assembled control.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	FISHER PART No.	NOTES
R4	1meg		RC20BF105K	
R5	470Ω		RC20BF471K	
R6	1meg		RC20BF105K	
R7	100K		RC20BF104K	Note 1
R8	1meg		RC20BF105K	
R9	33K		RC20BF333K	
R10	470Ω		RC20BF471K	
R11	4700Ω		RC20BF472K	
R12	2700Ω		RC20BF272K	
R13	10Ω		RC20BF100K	
R14	1meg		RC20BF105K	
R15	1000Ω		RC20BF102K	
R16	47Ω		RC20BF470K	Note 2
R17	1meg		RC20BF105K	

PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS (cont)

ITEM No.	RATING OHMS	RATING WATT	FISHER PART No.	NOTES
R18	1000Ω		RC20BF102K	
R19	22K		RC20BF223K	
R20	470K		RC20BF474K	
R21	330K		RC20BF334K	
R22	1000Ω		RC20BF102K	
R23	100Ω		RC20BF101K	Note 2
R24	100K		RC20BF104K	
R25	47K		RC20BF473K	
R26	1.8meg		RC20BF185K	
R27	330K		RC20BF334K	
R28	1000Ω		RC20BF102K	
R29	68Ω		RC20BF680K	
R30	6800Ω		RC20BF682K	Note 1
R31	2200Ω		RC20BF222K	Note 3
R32	3900Ω		RC20BF392K	Note 1
R33	39K		RC20BF393K	Note 1
R34	68Ω		RC20BF680K	
R35	270Ω		RC20BF271K	
R36	68K		RC20BF683K	
R37	1500Ω		RC20BF152K	
R38	6800Ω		RC20BF682K	
R39	220K		RC20BF224K	Note 4
R40	150K		RC20BF154K	Note 5
R41	1000Ω		RC20BF102K	
R42	6800Ω		RC20BF682K	
R43	47K		RC20BF473K	
R44	330K		RC20BF334K	
R45	220K		RC20BF224K	
R46	2700Ω		RC20BF272K	
R47	2.2meg		RC20BF225K	
R48	220K		RC20BF224K	
R49	330K		RC20BF334K	
R50	2200Ω		RC20BF222K	Note 6
R51	3.3meg		RC20BF335K	
R52	2.2meg		RC20BF225K	
R53	120K		RC20BF124K	
R54	220K		RC20BF224K	
R55	1meg		RC20BF105K	
R56	3.3meg		RC20BF335K	
R57	100K		RC20BF104K	
R58	1500Ω		RC20BF152K	
R59	47K		RC20BF473K	
R60	47K		RC20BF473K	
R61	68K		RC20BF683K	
R62	47K		RC20BF473K	
R63	47K		RC20BF473K	
R64	68K		RC20BF683K	
R65	100K		RC20BF104K	
R66	2700Ω		RC20BF272K	
R67	220K		RC20BF224K	
R68	1000Ω		RC20BF102K	
R69	680Ω		RC20BF681K	
R70	6800Ω		RC20BF682K	
R71	1.2meg		RC20BF125K	
R72	47K		RC20BF473K	
R73	2700Ω		RC20BF272K	
R74	47K		RC20BF473K	
R75	470K		RC20BF474K	Note 5
R76	33K		RC20BF333K	Note 7
R77	68Ω		RC20BF680K	
R78	470K		RC20BF474K	Note 5
R79	68Ω		RC20BF680K	
R80	270Ω	2	RC40BF271K	Note 8
R81	270Ω	2	RC40BF271K	Note 1
R82	50Ω	7	R-592-168	
R83	100Ω	5	RC20BF101K	Note 9
R84	10K		RC20BF103K	
R85	400Ω 5%	5		Note 10

Note 1. Not used in some versions.
Note 2. Some versions may use 68Ω in this application (Part #RC20BF680K).
Note 3. Some versions may use 1200Ω in this application (Part #RC20BF122K).
Note 4. Some versions may use 100K in this application (Part #RC20BF224K).
Note 5. Some versions may use 330K in this application (Part #RC20BF334K).
Note 6. Some versions may use 2700Ω in this application (Part #RC20BF272K).
Note 7. Some versions may use 68K in this application (Part #RC20BF683K).
Note 8. Some versions may use 600Ω 5W in this application (Part #R-592-182).
Note 9. Some versions may use 47Ω 2W in this application (Part #RC40BF470K).
Note 10. Some versions may use 920Ω 5W in this application (Part #R-592-167).

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	FISHER PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V @1.4A	780VCT @.140A tap @ 400VCT @.070A	5V @ 2A	T-592-125-1						
	SEC. 3									
	6.3V @6.2A									

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	FISHER PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	4300Ω CT	16Ω tap @ 8Ω, 4Ω	T-563-117					22S78 1		1 Use original shields

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	FISHER PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1	FM Ant. Trans.	L-592-135					
L2	RF Choke	L-520-178	19-1002	BC-563	4606		2 Microhenries
L3	RF Choke		19-1003	BC-564	4608		3.4 Microhenries
L4	FM RF Coil	L-592-137					
L5	FM Osc. Coil	L-592-136					
L6	Cathode Choke		19-1002	BC-563	4606		2.2 Microhenries, IRC Part #CLA
L7	Loop Stick	L-592-134					
L8	AM RF Trans.	L-556-125					
L9	AM Osc. Coil	L-550-122			70-OSC *		* Disregard primary
L10	1st. FM IF	ZZ-2987	16-3487	FM-254	1463		
L11	1st. AM IF	ZZ-2985	16-6758	BC-352	12-C1	RF-1	
L12	2nd. FM IF	ZZ-509-130	16-3487	FM-254	1463		
L13	2nd. AM IF	ZZ-2984	16-6758	BC-353	12-C2	RF-2	
L14	3rd. FM IF	ZZ-509-130	16-3487	FM-254	1463		
L15	Ratio Det.	ZZ-592-170					
L16	Fil. Choke	L-520-156	19-1000	BC-561	4602		1.2 Microhenries
L17	Fil. Choke	L-520-156	19-1000	BC-561	4602		1.2 Microhenries
L18	Fil. Choke	L-520-156	19-1000	BC-561	4602		1.2 Microhenries
L19A	Fil. Choke	L-509-140	19-1002	BC-563	4606		2.5 Microhenries
B	Fil. Choke		19-1002	BC-563	4606		2.5 Microhenries

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	FISHER PART No.	REPLACEMENT DATA
K1	Tone Compensation		PC-552-105	

FUSES

ITEM No.	TYPE	RATING	FISHER PART No. FUSE	FISHER PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M1	3AG	3A 125V	F-592-171		313003.	342001	MDL3	HKP

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	FISHER PART No.	CBS PART No.	SYLVANIA PART No.	NOTES
M2	1N541		1N35	1N60	Ratio Detector (Clip-in)
M3	1N541		1N35	1N60	Ratio Detector (Clip-in)

MISCELLANEOUS

ITEM No.	PART NAME	FISHER PART No.	NOTES
M4	Dial Lamp	I-563-145	
M5	Dial Lamp	I-563-145	
M6	Lamp	I-588-120	AM
M7	Lamp	I-588-120	FM
M8	Lamp	I-588-120	Phono
M9	Lamp	I-588-120	Tape
M10	Lamp	I-588-120	Aux 1
M11	Lamp	I-588-120	Aux 2
M12	Tuning Cap.	C-592-116	FM-AM, 6 Gang (AM Sections: 33-465mmf, RF 12-385mmf, Osc. 17-170mmf)
M13	Switch	S-592-127	Channel Selector (Rotary, wafer type)
M14	Switch	S-592-149	Power, On-Off, SPST
M15	Meter	M-551-134	Tuning
	Dial Glass	N-592-123	

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

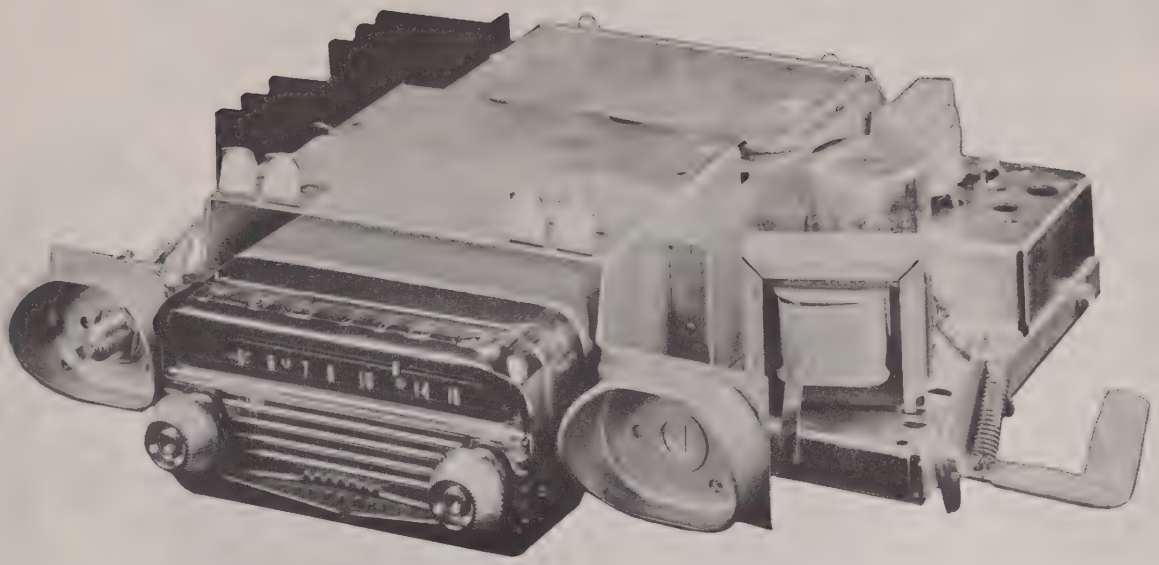
Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

PHOTOFACT* Folder

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

PONTIAC
MODEL 988837

PONTIAC
MODEL 988837



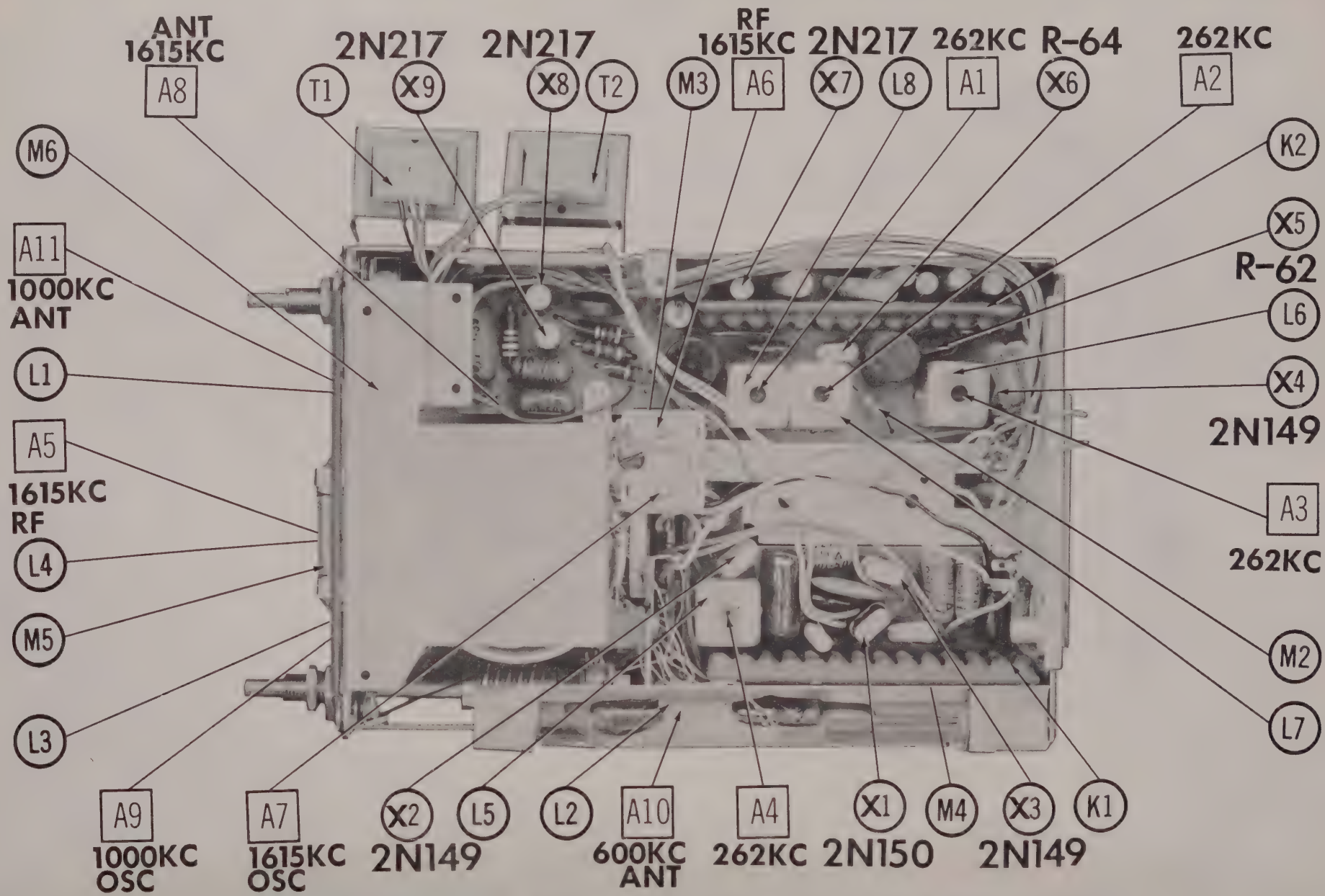
PONTIAC
MODEL 988837

TRADE NAME	Pontiac Model 988837 (For 1958 Pontiac Automobiles)
MANUFACTURER	Delco Radio Div., G.M. Corp., Kokomo, Indiana
TYPE SET	Battery Operated Custom Built AM Transistorized Automobile or Portable Receiver
POWER SUPPLY	12 Volt Storage Battery (or) 6 Volts DC (Self Contained Battery)
RATING	1.2 Amp. @ 12.6 Volts DC (or) 6MA @ 6 Volts DC (Portable)
TUNING RANGE	BROADCAST 550-1600KC

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1958 Howard W. Sams & Co., Inc., Indianapolis 5, Indiana. Printed in U.S. of America

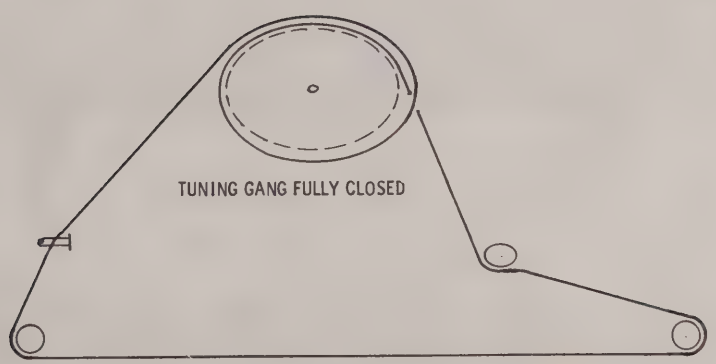
H590

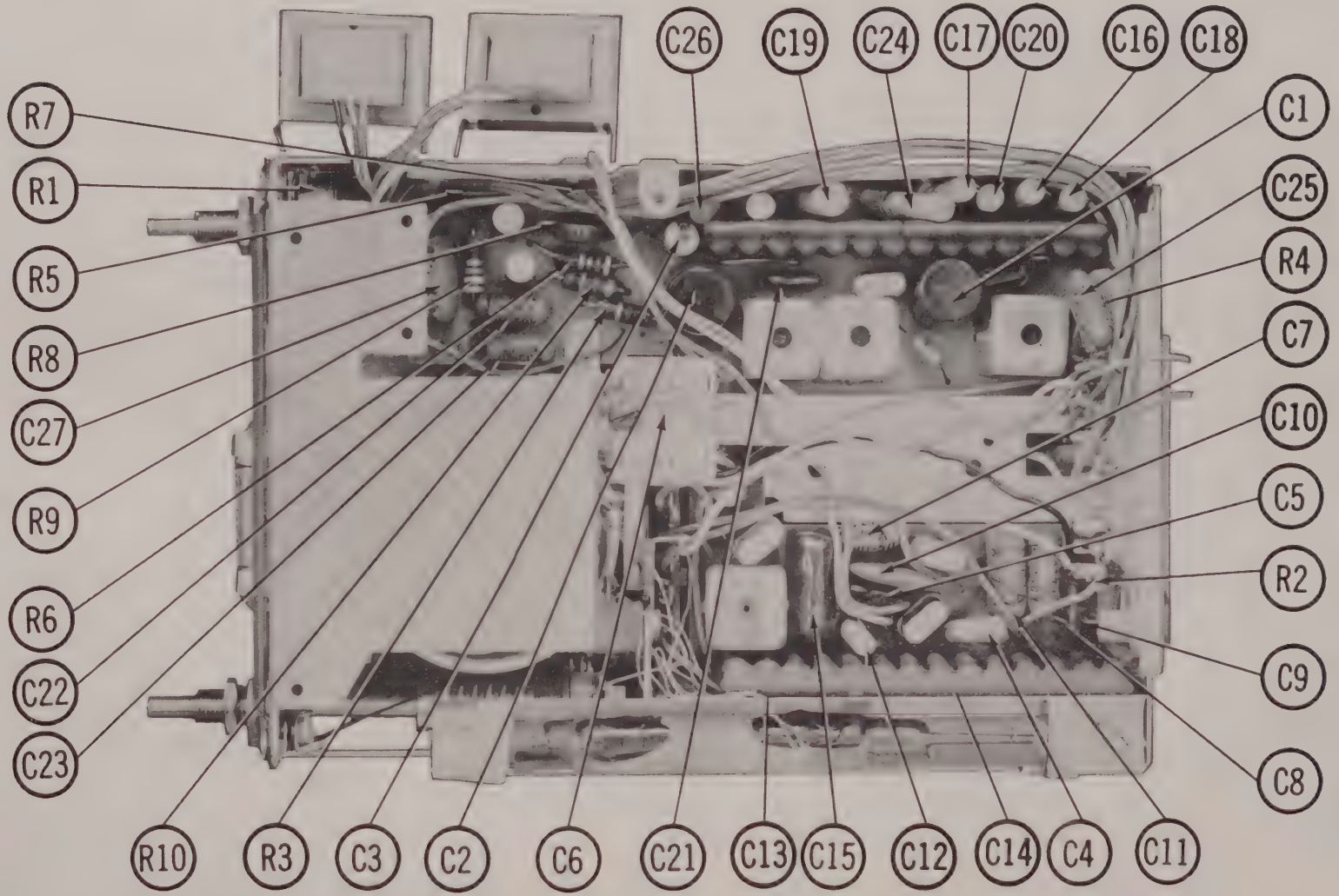


CHASSIS PORTABLE UNIT - ALIGNMENT. INDUCTOR & MISC. IDENT.

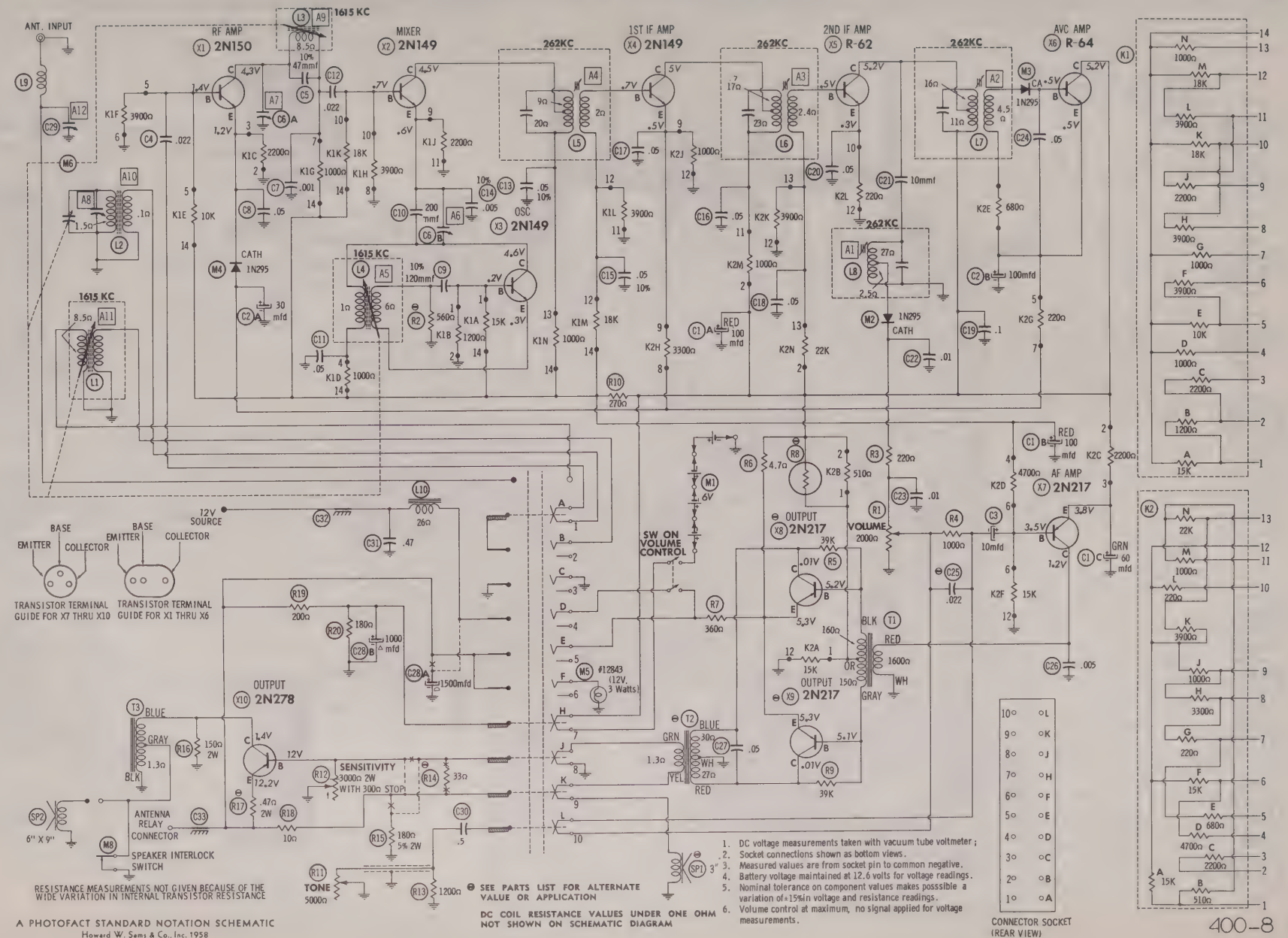
ALIGNMENT INSTRUCTIONS

	ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT						
	Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.						
	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1mfd	High side to base of 2N149 (X2 Mixer). Low side to chassis.	262KC	High frequency end stop	Across voice coil	A1, A2, A3, A4	Adjust for maximum output.
	Check setting of tuning cores (A5, A9, A11). Rear of cores should be 1 11/32" from back of coil form.						
2.		Loop	1615KC	High frequency end stop	Across voice coil	A6, A7 A8	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		"	1000KC	1000KC	"	A9	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output. Repeat step 2.
4.		"	600KC	600KC	"	A10	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output by moving coil on core.
5.		"	1400KC	1400KC	"	A8	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
	Step 6 is not necessary unless antenna coil or core is replaced. Install portable unit in rack and remove covers from both portable unit and rack.						
6.	68mmf	High side to antenna receptacle. Low side to chassis.	1000KC	1000KC	Across voice coil	A11	Adjust for maximum output.
7.	With radio installed in car and antenna fully extended, tune in a weak station between 600KC and 1000KC. Adjust A12 for maximum output.						
	POINTER ADJUSTMENT						
	With radio tuned to a 1100KC signal, adjust pointer adjusting screw so that pointer coincides with 11 on the dial.						





CHASSIS PORTABLE UNIT - CAPACITOR & RESISTOR IDENT.



RESISTANCE MEASUREMENTS NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE

A PHOTOFACT STANDARD NOTATION SCHEMATIC

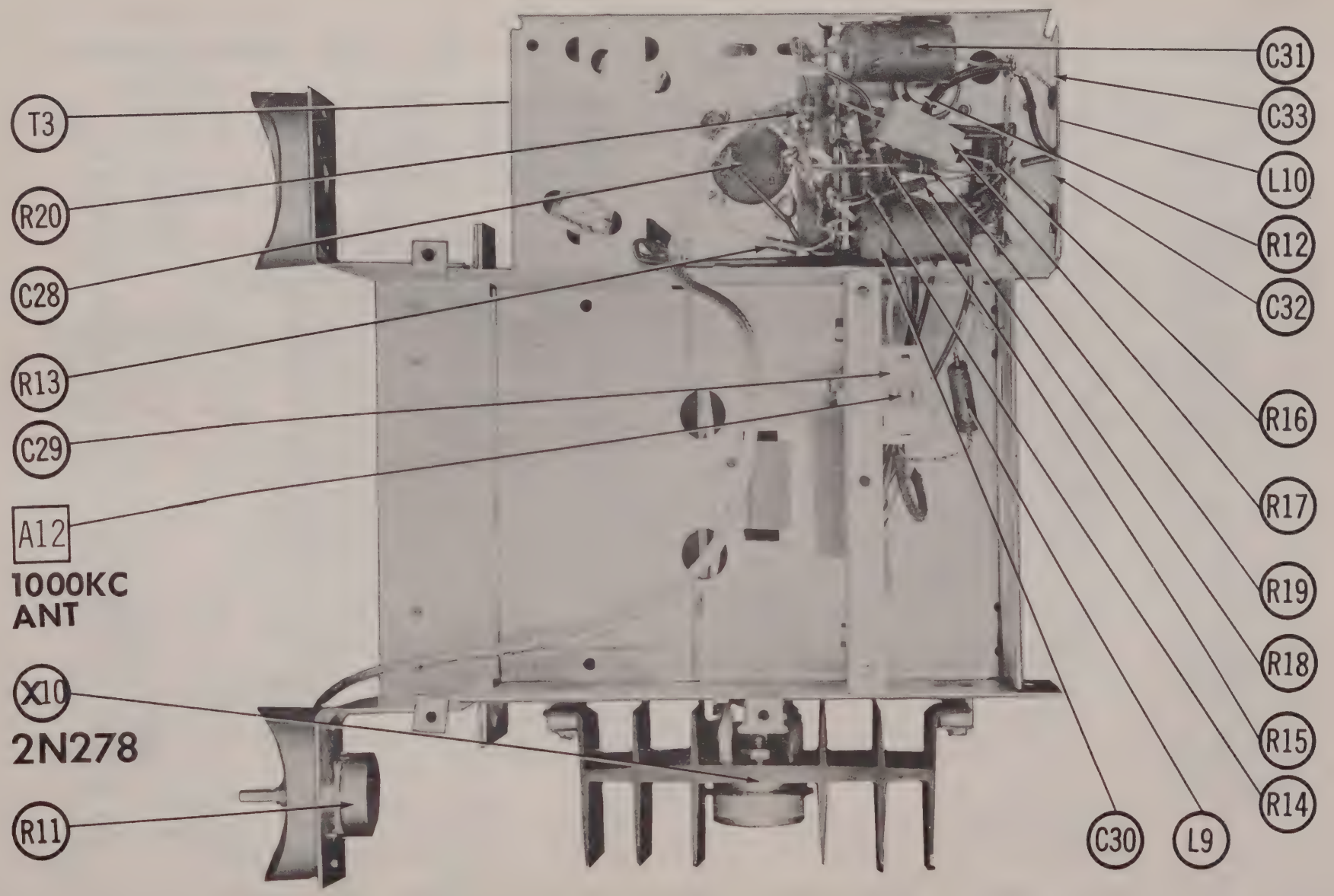
Howard W. Sams & Co., Inc. 1958

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

1. DC voltage measurements taken with vacuum tube voltmeter ;
2. Socket connections shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Battery voltage maintained at 12.6 volts for voltage readings.
5. Nominal tolerance on component values makes posssible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

400-8



CHASSIS RACK - BOTTOM VIEW

PARTS LIST AND DESCRIPTIONS

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA				NOTES
			CBS PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	2N150	RF Amplifier					
X2	2N149	Mixer					
X3	2N149	Oscillator					
X4	2N149	1st IF Amplifier					
X5	R-62	2nd IF Amplifier					
X6	R-64	AVC Amplifier					
X7	2N217	AF Amplifier					
X8	2N217	Output					Used as driver when radio is in car.
X9	2N217	Output					Used as driver when radio is in car

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	DELCO PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	100	8	7271256						
B	100	8							
C	60	8							
C2A	30	6	7271257						
B	100	6							
C3	10	8	7271255			TT12X10			

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	DELCO PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C4	.022	50	7271301							
C5	47		6367							10%
C6A			7270793							
B										
C7	.001	50	6627							
C8	.05	50	7270974							
C9	120		6372							10%
C10	200		7271299							
C11	.05	50	7270974							
C12	.022	50	7271301							
C13	.05	50	7270974							10%
C14	.005	50	6631							10%
C15	.05	50	7270974							10%
C16	.05	50	7270974							
C17	.05	50	7270974							
C18	.05	50	7270974							
C19	.1	50	7271302							
C20	.05	50	7270974							
C21	10		1215549							5%
C22	.01	50	7270975							
C23	.01	50	7270975							
C24	.05	50	7270974							
C25	.022	50								①
C26	.005	50	6631							
C27	.05	50	7270974							

① Some versions may use .05mfd in this application (Part #7270974).

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	DELCO PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1	2000Ω	½	7270665					Volume & Switch

PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		DELCO PART No.	NOTES
	OHMS	WATT		
R2	560Ω			Note 1
R3	220Ω		1117	
R4	1000Ω		1125	
R5	39K		1218	
R6	4.7Ω		7269775	

ITEM No.	RATING		DELCO PART No.	NOTES
	OHMS	WATT		
R7	360Ω		1213225	
R8			7270782	Note 2
R9	39K		1218	
R10	270Ω		1118	

Note 1. Some versions may use 1200Ω in this application (Part #1126).
Note 2. Temperature compensating unit.

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA							NOTES
	PRI.	SEC.	DELCO PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2.2	:1	7270811							

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	DELCO PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	400Ω CT	12Ω	7270804 ①	GH4 ②						① Used as driver when radio is installed in car. ② Use original channel frame.
	Turns Ratio									
	5.8	: 1								

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	DELCO PART No.	QUAM PART No.	
SP1	3"	PM	12Ω	7270796 ①		① Not used when radio is installed in car.

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		DELCO PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	Ant. Trans.	7270960					
L2	Loop Stick	7270777					
L3	RF Coil	7270789					
L4	Osc. Coil	7270756					
L5	1st IF	7270814					
L6	2nd IF	7270815					
L7	3rd IF	7270817					
L8	4th IF	7270816					

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	DELCO PART No.	REPLACEMENT DATA
K1	Resistor Unit	15K, 1200Ω, 2200Ω, 1000Ω, 10K, 3900Ω, 1000Ω, 3900Ω, 2200Ω, 18K, 3900Ω, 18K, 1000Ω	7271310	
K2	Resistor Unit	15K, 510Ω, 2200Ω, 4700Ω, 680Ω, 15K, 220Ω, 3300Ω, 1000Ω, 3900Ω, 220Ω, 1000Ω, 22K	7271309	

PORTABLE
PARTS LIST AND DESCRIPTIONS (Continued)

BATTERIES

ITEM No.	VOLTAGE	DELCO PART No.	REPLACEMENT DATA								NOTES
			BURGESS		EVEREADY		MALLORY		RAY-O-VAC		
			"A"	"B"	"A"	"B"	"A"	"B"	"A"	"B"	
M1	6V			Z		915		M-15R		7-R	4 used

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA			NOTES
		DELCO PART No.	CBS PART No.	SYLVANIA PART No.	
M2	1N295	7269746	1N60	1N60	Det. (Pigtail)
M3	1N295	7269746	1N60	1N60	AVC Rect. (Pigtail)
M4	1N295	7269746	1N60	1N60	Overload Limiter (Pigtail)

MISCELLANEOUS

ITEM No.	PART NAME	DELCO PART No.	NOTES
M5	Dial Lamp	7270646	#12843, (12V, 3 Watts)
M6	Tuning Cap.	7270662	Ant. 25-277mmf
	Printed Board	7270962	IF
	Printed Board	7270963	RF

WIRING DATA

General-use Unshielded Hook-up Wire .....Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

RACK
PARTS LIST AND DESCRIPTIONS

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA				NOTES
			CBS PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X10	2N278	Output					

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	DELCO PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C28A	▲1500	16	7270954			WP200.25			
B	▲1000	10							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	DELCO PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C29			7271696							
C30	.5	100	7270955	P288N-5		CUB2P5		GEM-205	2TM-P5	
C31	.47	100	6692	P288N-47		CUB2P47		GEM-2047	2TM-P47	
C32			7271564							
C33			7271564							

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	DELCO PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R11A	5000Ω	½	7271642					Tone
B	Shaft							
R12	3000Ω	2	7269743					Sensitivity With 300Ω Stop (Wire wound)

RACK
PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		DELCO PART No.	NOTES
	OHMS	WATT		
R13	1200Ω		1126	Note 1
R14	33Ω			
R15	180Ω 5%	2	1190	
R16	150Ω	2	1189	

ITEM No.	RATING		DELCO PART No.	NOTES
	OHMS	WATT		
R17	.47Ω	2	7270608	Note 2
R18	10Ω		1101	
R19	200Ω		1213221	
R20	180Ω		1116	

Note 1. Not used in some versions. Note 2. Fuse type resistor.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	DELCO PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T3	Full winding	CT to Gnd	7271865							
	9.2Ω	3-4Ω								
	Turns Ratio									
	1.5	: 1								

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	DELCO PART No.	QUAM PART No.	
SP2	6" X 9"	PM	3-4Ω	7270132	69A3	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		DELCO PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L9	Ant. Coil	7255738	19-1004	BC-565	4610		6.5 Microhenries

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA						
	CURRENT (Measured)	DC RES.	INDUCTANCE (0 CURRENT 1000 ∿)	DELCO PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L10	1A	26Ω	.003 Hy.	7269647						

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			DELCO PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M7		7 1/2A 32V	455640					

MISCELLANEOUS

ITEM No.	PART NAME	DELCO PART No.	NOTES
M8	Switch	1221152	Speaker Interlock
	Speaker Ass'y	Models 988838, 988839	Complete, for Dual 6" X 9" Rear Seat Speaker Installation
	Speaker Ass'y	Models 988840, 988906	Complete, for Single Rear Seat Speaker Installation

WIRING DATA

General-use Unshielded Hook-up Wire .....Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors
Shielded Hook-up Wire .....Use BELDEN No. 8885
Bonding Strap .....Use BELDEN No. 8661

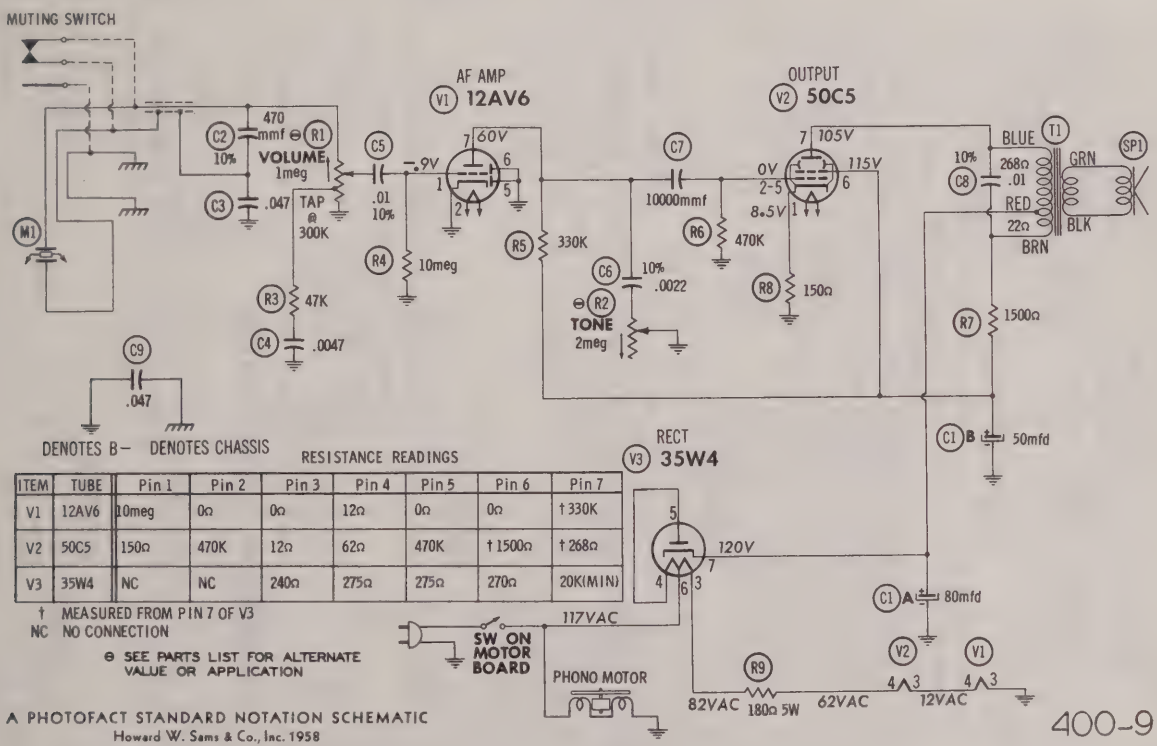
PHOTOFACT* Folder

RCA VICTOR MODELS 9ED2KF, 9ED2LE, 9ED32HJ, 9ED32LJ, 9ES5H, 9ES5JE (Ch. RS-170, B)

RCA VICTOR MODELS 9ED2KF, 9ED2LE, 9ED32HJ, 9ED32LJ, 9ES5H, 9ES5JE (Ch. RS-170, B)

TRADE NAME	RCA Victor Models 9-ED-2LE, 9-ED-2KF (Ch. RS-170D); 9-ED-32HJ, 9-ED-32LJ (Ch. RS-170); 9-ES-5H, 9-ES-5JE (Ch. RS-170B)
MANUFACTURER	RCA Victor Radio & "Victrola" Div., Radio Corp. of America, Camden 8, N. J.
TYPE SET	AC Operated Phono Amplifier with Automatic Record Changer
TUBES (Three)	Types 12AV6 AF Amplifier, 50C5 Output, 35W4 Rectifier
POWER SUPPLY	110-120 Volts AC-60 Cycles — RATING .26 Amp. @ 117 Volts AC (25 Watts without Motor)

MODELS 9-ED-2LE, 9-ED-2KF, 9-ED-32HJ AND 9-ED-32LJ HAVE 33-1/3 RPM (SINGLE PLAY) AND 45 RPM (AUTOMATIC) RECORD CHANGER RP-208-3. FOR SERVICE INFORMATION-SEE RCA RP-208 SERIES— PHOTOFACT SET 391 FOLDER 11. MODELS 9-ES-5H AND 9-ES-5JE HAVE 4 SPEED AUTOMATIC RECORD CHANGE RP-205D-2. FOR SERVICE INFORMATION-SEE RCA RP-205 SERIES— PHOTOFACT SET 358 FOLDER 10.



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	12AV6	10meg	0Ω	0Ω	12Ω	0Ω	0Ω	†330K
V2	50C5	150Ω	470K	12Ω	62Ω	470K	†1500Ω	†268Ω
V3	35W4	NC	NC	240Ω	275Ω	275Ω	270Ω	20K(MIN)

† MEASURED FROM PIN 7 OF V3
NC NO CONNECTION
⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1958

400-9

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1958 Howard W. Sams & Co., Inc., Indianapolis 5, Indiana. Printed in U.S. of America

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	AF Amplifier	12AV6	
V2	Output	50C5	
V3	Rectifier	35W4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA RCA Victor PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	80	150	105279	PRS150V8050	BBRD8515	TCD498	TDLD-12	FMD-303	TVA-2462
B	50	150							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA RCA Victor PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C2	470		75198		D6-471	5R5T47	GP-470			10%
C3	.047	600	105273	P688N-047	DF-503	CUB6S47		GEM-4147	6TM-S47	
C4	.0047	400	73920					GEM-16247		10%
C5	.01	200	79316	P288N-01	D6-103	CUB4S1	GP-10000	GEM-411	4TM-S1	
C6	.0022	600	73595							10%
C7	10000		73960	BPD-01	DD-103	BYA10S1	ED-01	DC511	5HK-S1	
C8	.01	400	73561					GEM-1611		10%
C9	.047	600	105273	P688N-047	DF-503	CUB6S47		GEM-4147	6TM-S47	

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA RCA Victor PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1meg	½	105509 ①	ABT-73	A47F-1meg	Q13-137X	UT-438	Volume, Tap ⓐ 300K
B	Shaft			AK-11	KSS-3	Not Req.	Not Req.	
R2A	2meg	½	104664 ②	B-76	A47-2meg-Z	Q13-139	U55	Tone
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	

① Part #105510 is used in Models 9-ED-2LE, 9-ED-2KF
Part #102510 used in Models 9-ES-5H, 9-ES-5JE
② Part #105269 used in Models 9-ED-2LE, 9-ED-2KF, 9-ES-5H, 9-ES-5JE

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	RCA Victor PART No.	NOTES
R3	47K		502347	
R4	10meg		502610	
R5	330K		502433	
R6	470K		502447	
R7	1500Ω		502215	
R8	150Ω		502115	
R9	180Ω	5	105274	

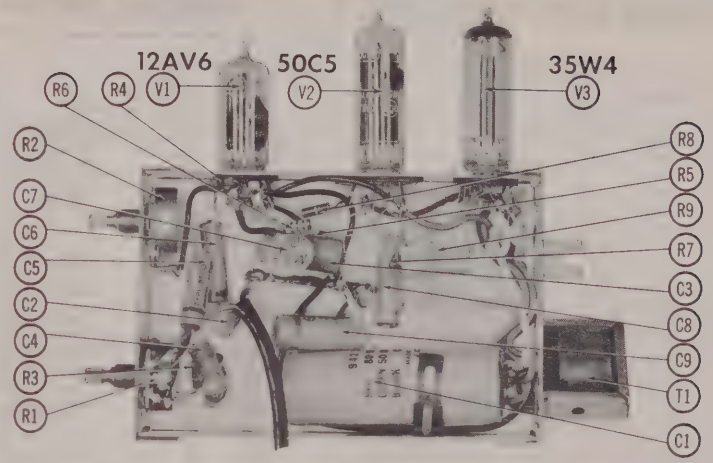
TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA RCA Victor PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	3000Ω	3-4Ω	105173	Z1105 ①	A-3031①		A-3336 ①	24S50A①	S-16X①	① Drill new mounting hole.

SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	REPLACEMENT DATA RCA Victor PART No.	REPLACEMENT DATA QUAM PART No.	NOTES
SP1	4" x 6"	PM	3-4Ω	104846	46A15	

CHASSIS—BOTTOM VIEW



PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA RCA Victor PART No.	ASTATIC PART No. CARTRIDGE	ASTATIC PART No. NEEDLE	ELECTRO-VOICE PART No. CARTRIDGE	ELECTRO-VOICE PART No. MOUNT	REMARKS
M1	79791	51-1	G-J	51-1	PFT-1	Models 9-ED-2KF, 9-ED-32-HJ, 9-ED-2LE 9-ED-32LJ
	100653	55-T or 81-TB		56	PT-2	Models 9-ES-5H, 9-ES-5JE

ASTATIC NEEDLE LISTING SHOWN ABOVE IS SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGE LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACE MENTS SEE BELOW.

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA RCA Victor PART No.	JENSEN PART No.	WALCO PART No.	REMARKS
M2	79849	† S-63LP or ♦ S-63LPD	† W-76MGS or ♦W-76MGD	Models 9-ED-32HJ, 9-ED-2LE, 9-ED-2KF, 9-ED-32LJ
	78827	† S-66 or †♦ S-66SD or ♦ S-66D	† W75TPS or †♦W75DS or ♦W75TPD	Models 9-ES-5H, 9-ES-5JE

* Metal † Jewel ♦ Diamond

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	104801	Tone & Volume, Models 9-ED-32HJ, 9-ED-32LJ
Knob	105427	Tone & Volume, Model 9-ED-2LE
Knob	105428	Tone & Volume, Model 9-ED-2KF
Knob	105270	Tone & Volume, Model 9-ES-5H
Knob	105271	Tone & Volume, Model 9-ES-5JE

WIRING DATA

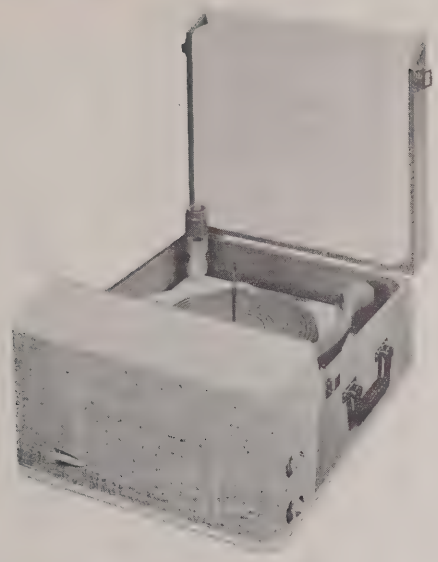
General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors
Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting) .....Use BELDEN No. 8401
Phono Pick-up Arm Cable ..... Use BELDEN No. 8430 (Two Conductor - Twisted)

PHOTOFACT* Folder

*TRADE MARK

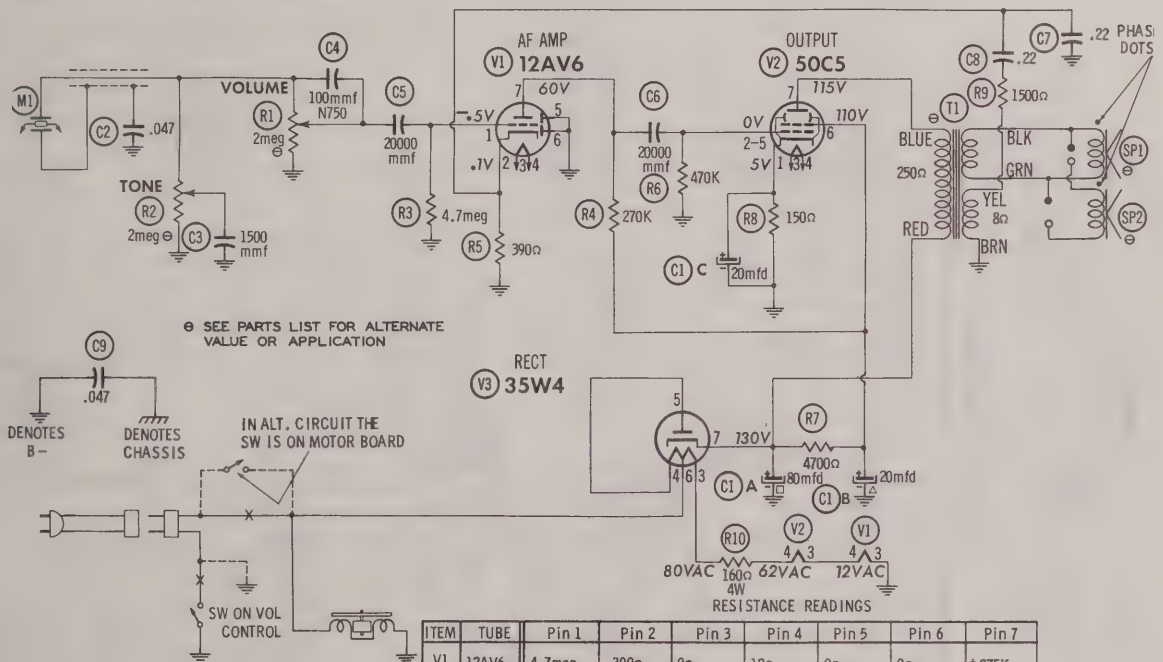
EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

SILVERTONE MODELS 8239, 8242, 8244, 8245, 8246, 8247, 8248 (Ch. 528.59010, 528.59020, 567.59020)



TRADE NAME	Silvertone Models 8239, 8242 (Ch. 528.59020, 567.59020) ; 8244, 8245, 8246, 8247, 8248 (Ch. 528.59010)
SUPPLIER	Sears,Roebuck & Co., 925 S. Homan, Chicago, Illinois
TYPE SET	AC Operated Phono Amplifier With 4 Speed Automatic Record Changer
TUBES (Three)	Types 12AV6 AF Amplifier, 50C5 Output, 35W4 Rectifier
POWER SUPPLY	110-120 Volts AC-60 Cycles RATING .26 Amp. @ 117 Volts AC (25 Watts Less Motor)

FOR SERVICE INFORMATION ON RECORD CHANGERS 528.56100, 528.56110, 528.56120, 528.56130, 528.56140, 528.56150 — SEE SILVERTONE 567.40000 — PHOTOFACT SET 365 FOLDER 13. RECORD CHANGER 528.57000 OR 528.57010 USED IN MODEL 8239.



ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	12AV6	4.7meg	390Ω	0Ω	12Ω	0Ω	0Ω	†275K
V2	50C5	150Ω	470K	12Ω	62Ω	470K	†4700Ω	†250Ω
V3	35W4	NC	NC	220Ω	250Ω	250Ω	240Ω	20K(MIN)

A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1958

† MEASURED FROM PIN 7 OF V3.
NC NO CONNECTION.

400-10

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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H229

SILVERTONE MODELS 8239, 8242, 8244, 8245, 8246, 8247, 8248 (Ch. 528.59010, 528.59020, 567.59020)
SET 400 FOLDER 10

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	AF Amplifier	12AV6	
V2	Output	50C5	
V3	Rectifier	35W4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	SILVERTONE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	■80	150	18-53-5	PRS150/25V	BBRQ53215C	WQ230	CDB-Q-1001	FMT-333	*R2596
B	▲20	150		8040/20					
C	20	20							

* Non-catalog item.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	SILVERTONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C2	.047	400	20-55-1		BC6S47J			ACE6147	4SE-S47	Note 1
C3	1500		15-15217	BPD-0015	DD-152	BYA10D15	ED-1500	DC5215	5HK-D15	
C4	100		15-10116	N750-S1 100	TC7-100	C10T1U	TC7-100	NT-531	5TCU-T1	N750
C5	20000		15-20317	BPD-02	DD-203	BYB6S2	ED-02		5HK-S2	
C6	20000		15-20317	BPD-02	DD-203	BYB6S2	ED-02		5HK-S2	
C7	.22	200	20-43-1			BC2P22J		ACE6022	2SE-S22	
C8	.22	200	20-43-1			BC2P22J		ACE6022	2SE-S22	
C9	.047	400	20-55-1			BC6S47J		ACE6147	4SE-S47	Note 1

Note 1. Part #20-44-1 used in Models 8239, 8244, 8245, 8246, 8247, 8248.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	SILVERTONE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1	2meg	½	740085					Volume & Switch - Note 1
R2	2meg	½	740084					Tone - Note 2

Note 1. Alternate part #24-272-0 or #24-270-0 (No switch).
Note 2. Alternate part #24-270-0.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	SILVERTONE PART No.	NOTES
R3	4.7meg		60-47501	
R4	270K		60-27401	
R5	390Ω		60-39102	
R6	470K		60-47401	
R7	4700Ω		60-47202	
R8	150Ω		60-15102	
R9	1500Ω		60-15201	
R10	160Ω	4	61-102	

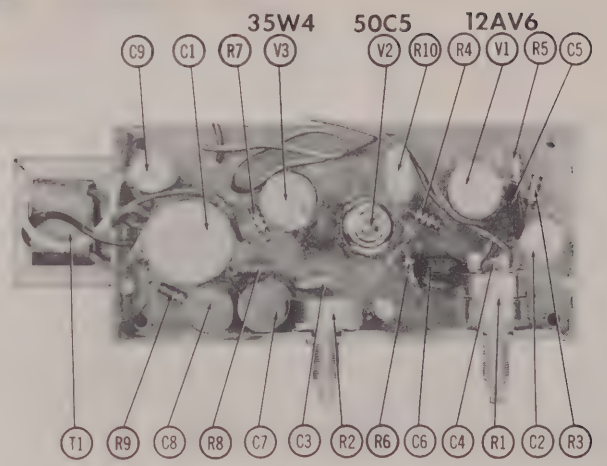
TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	SILVERTONE PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	2300Ω	1.6Ω	700081 ①							① Alternate part #80-5-1.

SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	SILVERTONE PART No.	QUAM PART No.	NOTES
SP1	5 1/4"	PM	3-4Ω	33-293-4 ①	52A1	① Parallel and phase. Used in Model 8242
SP2	5 1/4"	PM	3-4Ω	33-293-4 ①②③	52A1	② Used in Model 8239
	4"	PM	3-4Ω	33-256-4 ②		③ Used in Models 8244, 8245, 8246, 8247, 8248
	6"	PM	3-4Ω	33-280-4 ④		④ Used in Models 8244, 8245
	8"	PM	3-4Ω	33-278-4 ⑤		⑤ Used in Models 8246, 8247, 8248

CHASSIS—TOP VIEW



PHONO CARTRIDGE

ITEM No.	SILVERTONE PART No.	ASTATIC PART No. CARTRIDGE	ASTATIC PART No. NEEDLE	ELECTRO-VOICE PART No. CARTRIDGE	ELECTRO-VOICE PART No. MOUNT	REMARKS
M1	33-234-0 ①	55-T or 81-TB	GD-7	56	PT-2	① Used in Model 8242 Part #33-235-0 used in Models 8239, 8244, 8245, 8246, 8247, 8248

ASTATIC NEEDLE LISTING SHOWN ABOVE IS SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGE LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENTS SEE BELOW.

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	SILVERTONE PART No.	JENSEN PART No.	WALCO PART No.	REMARKS
M2	83-1172	†S-66 or †♦S-66SD or ♦S-66D	†W-75TPS or †♦W-75DS or ♦W-75TPD	† Jewel ♦ Diamond

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	52-775-0	On-Off-Volume & Tuning - Model 8242
Knob	52-892-0	Tone - Models 8245, 8246, 8247, 8248
Knob	52-893-0	Volume - Models 8245, 8246, 8247, 8248
Knob	52-772-0	On-off-Volume & Tone - Models 8239, 8244
Cabinet	42-4-2	Includes lid - Model 8242
Cabinet	42-5-2	Model 8244
Cabinet	42-33-2	Model 8245
Cabinet	42-16-2	Model 8246
Cabinet	42-17-2	Model 8247
Cabinet	42-53-2	Includes Lid - Model 8248
Cabinet	42-2-2	Includes Lid - Model 8239

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)

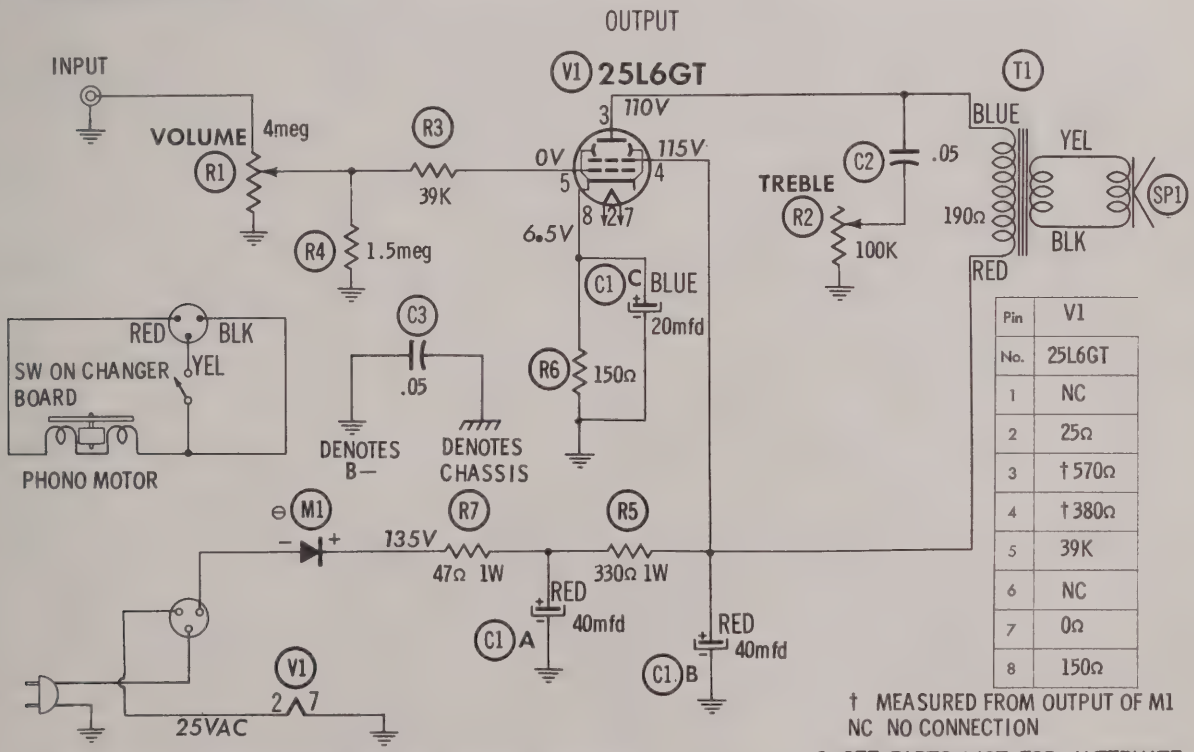
PHOTOFACT* Folder

STEELMAN MODEL 3A14-3

STEELMAN
MODEL 3A14-3

TRADE NAME	Steelman Model 3A14-3
MANUFACTURER	Steelman Phono & Radio Co., Inc., 12-30 Anderson Ave., Mount Vernon, N. Y.
TYPE SET	AC Operated Phono Amplifier with 4 Speed Automatic Record Changer
TUBES (One)	Type 25L6GT Output
POWER SUPPLY	110-120 Volts AC-60 Cycles — RATING .33 Amp. @117 Volts AC (33 Watts with Motor)

FOR SERVICE INFORMATION ON RECORD CHANGER—SEE V-M MODEL 1200A— PHOTOFACT SET 353 FOLDER 16 OR RECORD CHANGER MANUAL RC-10



Pin No.	V1 25L6GT
1	NC
2	25Ω
3	†570Ω
4	†380Ω
5	39K
6	NC
7	0Ω
8	150Ω

† MEASURED FROM OUTPUT OF M1
NC NO CONNECTION
Θ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

A PHOTOFACT STANDARD NOTATION SCHEMATIC

Howard W. Sams & Co., Inc. 1958
HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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H300

SET 400 FOLDER 11

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Output	25L6GT	

ITEM No.	USE	TYPE	NOTES

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	STEELMAN PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	40	150	CE-1000	PRS150V404020	BBRT44215	TCT3116	TDLT-4	FMT-312	R1110 *
B	40	150							
C	20	150							

* Non-Catalog Item

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	STEELMAN PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	.05	200	CP-503-2	P288N-05	DF-503	CUB2S5		GEM-415	2TM-S5	
C3	.05	400	CP-503-4	P488N-05	DF-503	CUB4S5		GEM-415	4TM-S5	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	STEELMAN PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	4meg	1/2	VC-76	B-85	A47-4meg-Z	Q13-140	U57	Volume
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
R2A	100K	1/2	VC-102	B-41	A47-100K-S	Q13-128	U39	Treble
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		STEELMAN PART No.	NOTES
	OHMS	WATT		
R3	39K			
R4	1.5meg			
R5	330Ω	1		

ITEM No.	RATING		STEELMAN PART No.	NOTES
	OHMS	WATT		
R6	150Ω			
R7	47Ω	1		

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	STEELMAN PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	1900Ω	3-4Ω	TR-122-1	Z1101	A-3025	AU-605	A-3332	24S53	S-12X	

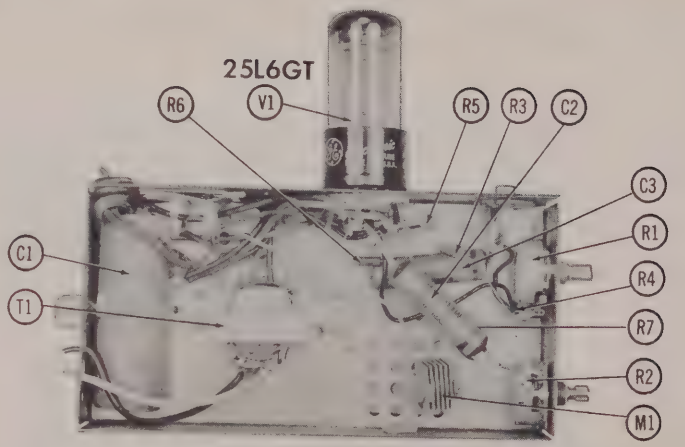
SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	STEELMAN PART No.	QUAM PART No.	
SP1	5"	PM	3-4Ω	SP-105	5A07	

RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA				NOTES
	CURRENT (Measured)	STEELMAN PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	SARKES TARZIAN PART No.	
M1	.047A	SE-1000 ①	1386	RS065 ①	65 ①	① Selenium Type
					M150 ②	② Silicon Type

CHASSIS—BOTTOM VIEW



PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA					REMARKS
	STEELMAN PART No.	ASTATIC PART No.		ELECTRO-VOICE PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	MOUNT	
M2	T0-222/9655①	64-TS	K-J and K-78-J			①Used in changers with brown metal or plastic tone arm approximately 1" wide. ②Used in changer with metal tone arm. ③Used in changers with narrow metal tone arm approximately 5/8" wide.
	T0-284-0V/9121 ②	422-TS	N8-1 and N8-3			
	T0-400-0V/7447 ③					

ASTATIC NEEDLE LISTING SHOWN ABOVE IS SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGE LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENTS SEE BELOW.

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA			REMARKS
	STEELMAN PART No.	JENSEN PART No.	WALCO PART No.	
M3	N-5304-N (78RPM)	† CRA-55 or ♦CRA-55D	† W64S or ♦W64D	† Jewel ♦ Diamond
	N-5304-L (LP)	† CRA-55LP or ♦CRA-55LPD	† W64MGS or ♦W64MGD	

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	KNP-13702-ML-1	Volume
Knob	KNP-13702-MTR-1	Treble
Case	CA-1055	

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors
Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting) .....Use BELDEN No. 8401
Phono Pick-up Arm Cable ..... Use BELDEN No. 8430 (Two Conductor - Twisted)

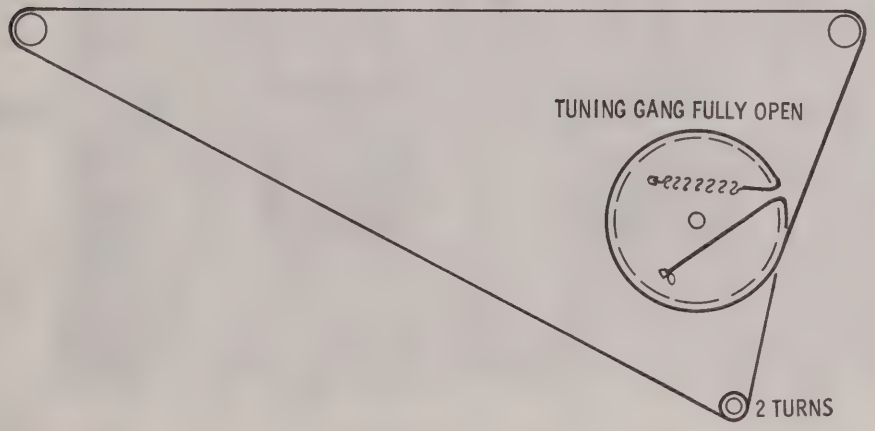
PHOTOFACT* Folder

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

STROMBERG-CARLSON MODEL SR-403B

STROMBERG-CARLSON
MODEL SR-403B

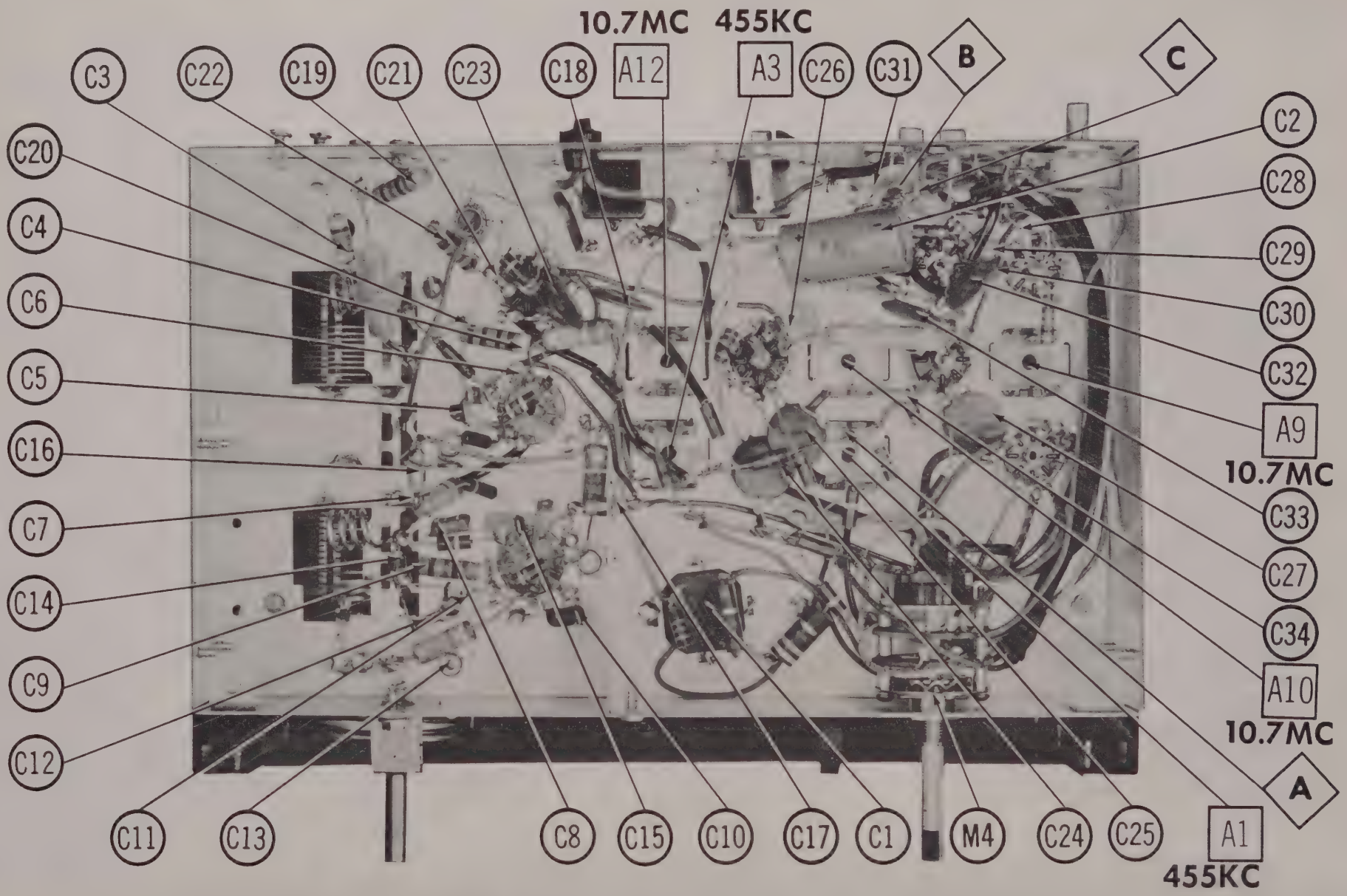
TRADE NAME	Stromberg-Carlson Model SR-403B	
MANUFACTURER	Stromberg-Carlson Co., National Service Dept., 1400 N. Goodman St., Rochester 3, N.Y.	
TYPE SET	AC Operated FM-AM Tuner	
TUBES (Eight)	Types 6BK7A FM RF Amplifier, 6U8 FM Mixer-FM Osc., 6BE6 AM Converter, 6BA6 1st. FM AM IF Amp., 6AU6 2nd. FM IF Amplifier, 6AL5 Ratio Detector, 6AT6 FM AVC Delay-AM Det. -AVC-AF Amp., 6X4 Rectifier	
POWER SUPPLY	110-120 Volts AC-60 Cycles	RATING .41 Amp. @ 117 Volts AC (40 Watts)
TUNING RANGE-BROADCAST	540-1600KC	FREQ. MOD. 88-108MC



STROMBERG-CARLSON
MODEL SR-403B

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

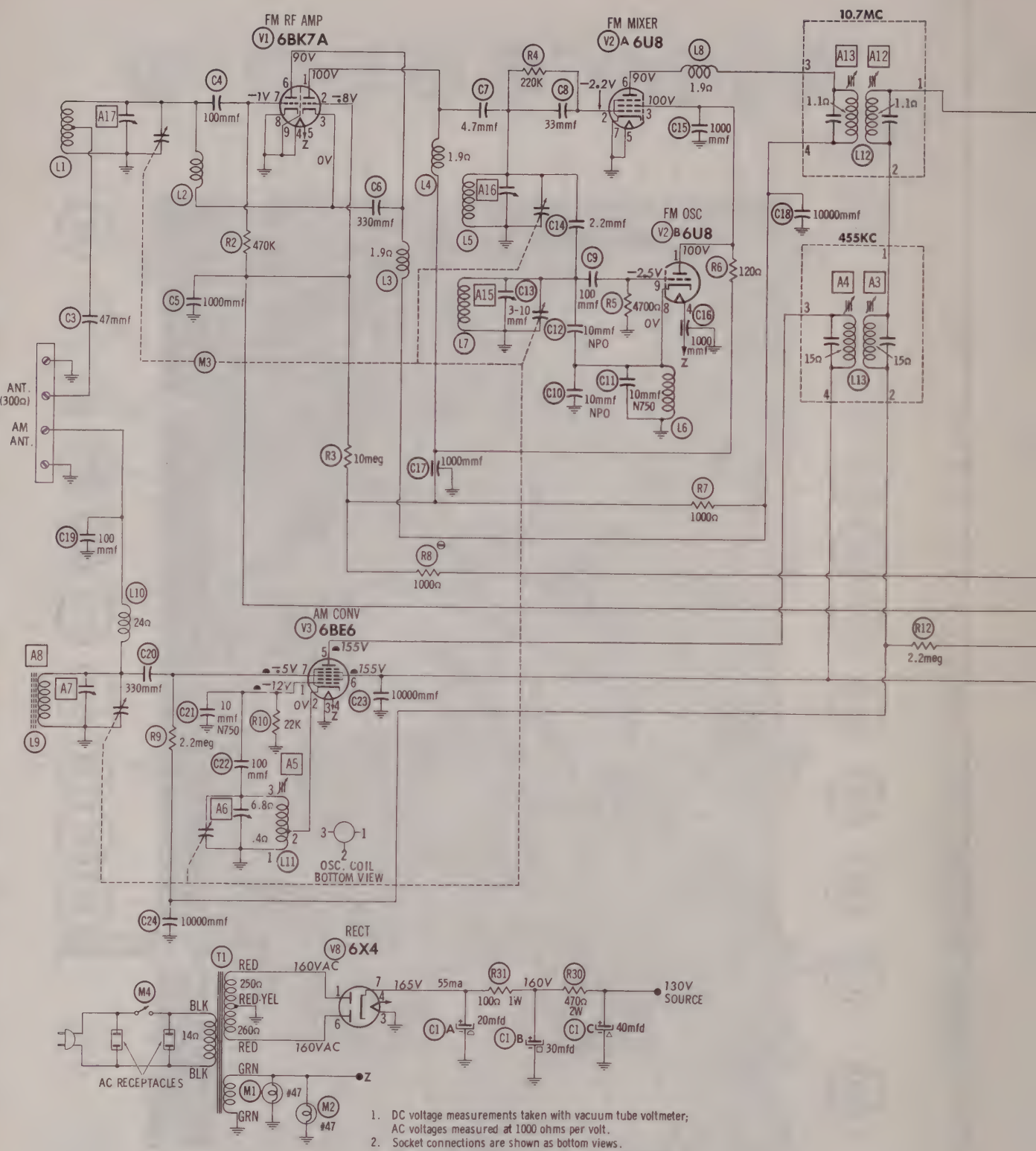
The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1958 Howard W. Sams & Co., Inc., Indianapolis 5, Indiana. Printed in U.S. of America



CHASSIS BOTTOM VIEW - ALIGN, CAPACITOR & MISC. IDENT.

CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

STROMBERG-CARLSON
MODEL SR-403B

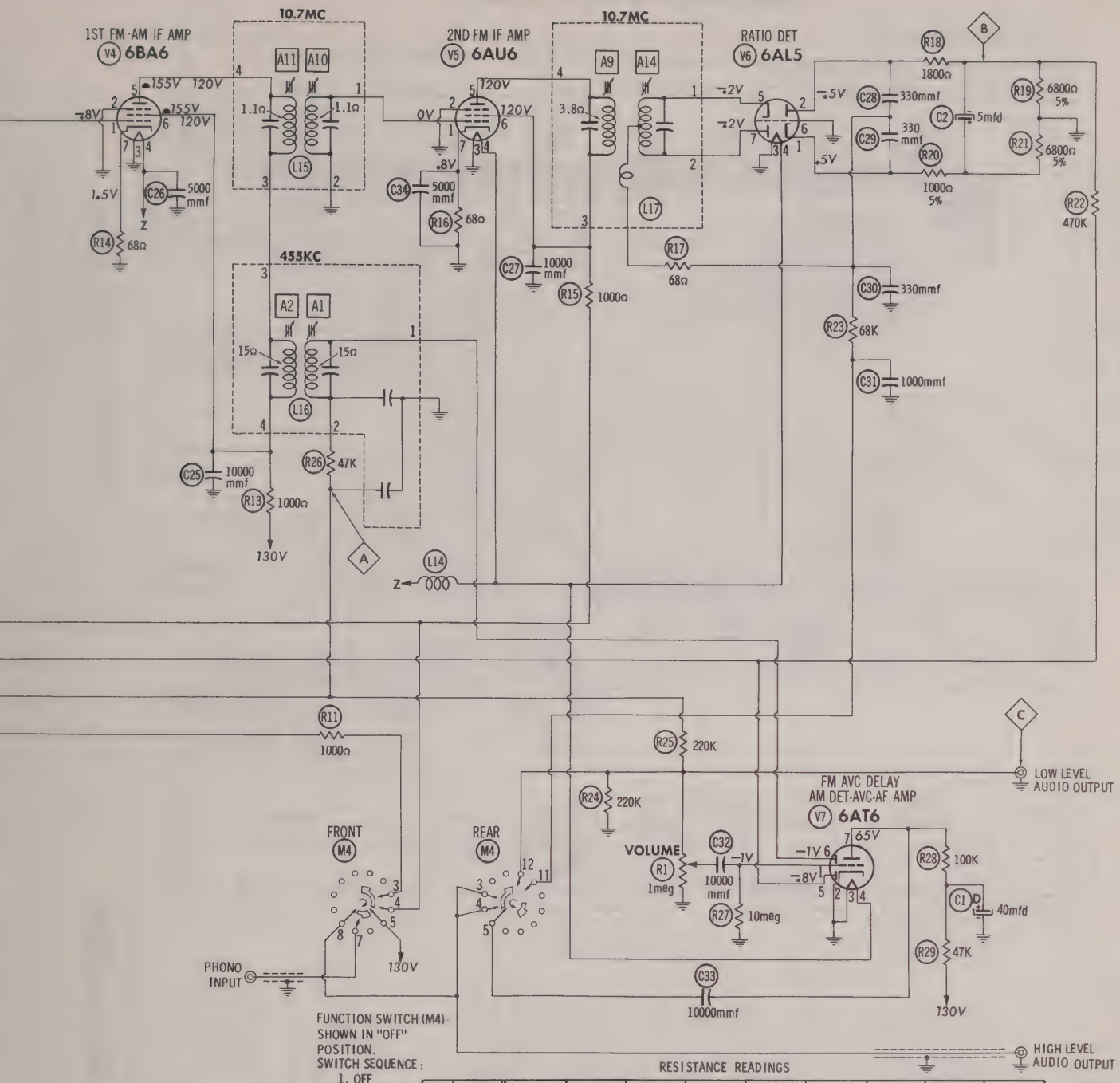


1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to commom negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

Θ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1958



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6BK7A	†1600Ω	360K	.1Ω	0Ω	.1Ω	†2600Ω	750K	0Ω	0Ω
V2	6U8	†1700Ω	220K	†1700Ω	.1Ω	0Ω	†2600Ω	0Ω	.2Ω	4700Ω
V3	6BE6	▬22K	▬.4Ω	0Ω	.1Ω	▬†1600Ω	▬†1600Ω	▬4.6meg		
V4	6BA6	2.6meg	0Ω	0Ω	.1Ω	†1600Ω	†1600Ω	68Ω		
V5	6AU6	1.1Ω	0Ω	0Ω	.1Ω	†1600Ω	†1600Ω	68Ω		
V6	6AL5	7800Ω	8600Ω	0Ω	.1Ω	230K	0Ω	230K		
V7	6AT6	10meg	0Ω	0Ω	.1Ω	360K	450K	†147K		
V8	6X4	250Ω	NC	0Ω	.1Ω	NC	260Ω	20K(Min)		

ALL MEASUREMENTS TAKEN IN "FM" POSITION UNLESS OTHERWISE DESIGNATED
▬ MEASURED IN "AM" POSITION
† MEASURED FROM PIN 7 OF V8
NC NO CONNECTION

400-12

ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

Volume control should be at maximum position. Output of signal generator s hould be no higher than necessary to obtain an output reading.
Use an insulated alignment screwdriver for adjusting.
To set pointer, close tuning gang and adjust pointer to "O" on logging scale.

AM ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
1.	.1mfd	High side to pin 7 (grid) of 6BE6 (V3). Low side to chassis.	455KC (400∿Mod)	AM	Point of non-interference at low end of dial.	DC probe to point Ⓐ. Common to chassis.	A1, A2, A3, A4	Adjust for maximum deflection.
2.	Direct	Loop	600KC	"	600KC	AC probe to high level audio output. Low side to chassis.	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.	"	"	1400KC	"	1400KC	"	A6, A7	"
4.	"	"	600KC	"	600KC	"	A5, A8	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output. Repeat steps 3 and4 until proper tracking is obtained.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
5.	.1mfd	High side to pin 2 (grid) of 6U8 (V2). Low side to chassis.	10.7MC (Unmod)	FM	100MC	DC probe to point Ⓑ. Common to chassis.	A9, A10, A11, A12, A13	Adjust for maximum deflection.
6.	"	"	"	"	"	DC probe to low level audio output Common to chassis.	A14	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND SCOPE

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
5.	.1mfd	High side to pin 2 (grid) of 6U8 (V2). Low side to chassis.	10.7MC (450KC Swp)	FM	100MC	Vert. Amp. to point Ⓑ. Low side to chassis.	A9, A10, A11, A12, A13	Disconnect stabilizing capacitor (C2). Adjust for curve of maximum amplitude and symmetry similar to Fig.1.
6.	"	"	"	"	"	Vert. Amp. to low level audio output. Low side to chassis.	A14	Reconnect capacitor (C2). Adjust so that 10.7MC occurs at center of crossover lines similar to Fig. 2. SLIGHTLY retouch A9 for maximum amplitude and straightness of crossover lines.

FM RF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
7.	270Ω Carbon Resistor	Across FM ant. terminals with 270Ω in high side.	100MC	FM	100MC	DC probe to point Ⓒ. Common to chassis.	A15, A16, A17	Adjust for maximum deflection.
8.	Check dial calibration and sensitivity at 108MC, 106MC, 90MC and 88MC as compared with 100MC (Step 7). If variation is excessive, SLIGHTLY compress or expand L7, L5 and L1. Repeat steps 7 and 8 until proper tracking is obtained.							

FIG. 1

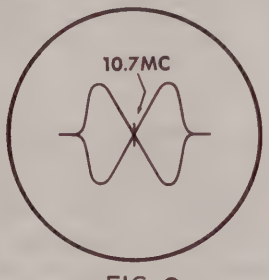


FIG. 2

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	FM RF Amplifier	6BK7A	
V2	FM Mixer-FM Osc.	6U8	
V3	AM Converter	6BE6	
V4	1st. FM AM IF Amp.	6BA6	

ITEM No.	USE	TYPE	NOTES
V5	2nd. FM IF Amp.	6AU6	
V6	Ratio Detector	6AL5	
V7	FM AVC Delay-AM Det. - AVC-AF Amp.	6AT6	
V8	Rectifier	6X4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA Stromberg-Carlson PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	▲20	250	111625-000	AFH4-02-10	D0022	FP419.5	TMQ-116	Q-345 MT-4540	TVL-4580
B	■30	250							
C	▲40	200							
D	40	200							
C2	5	50	111093-000	PRS50V5	BBR5-50	TC30	TD-5-50	MT-0504	TVA-1303

FIXED CAPACITORS

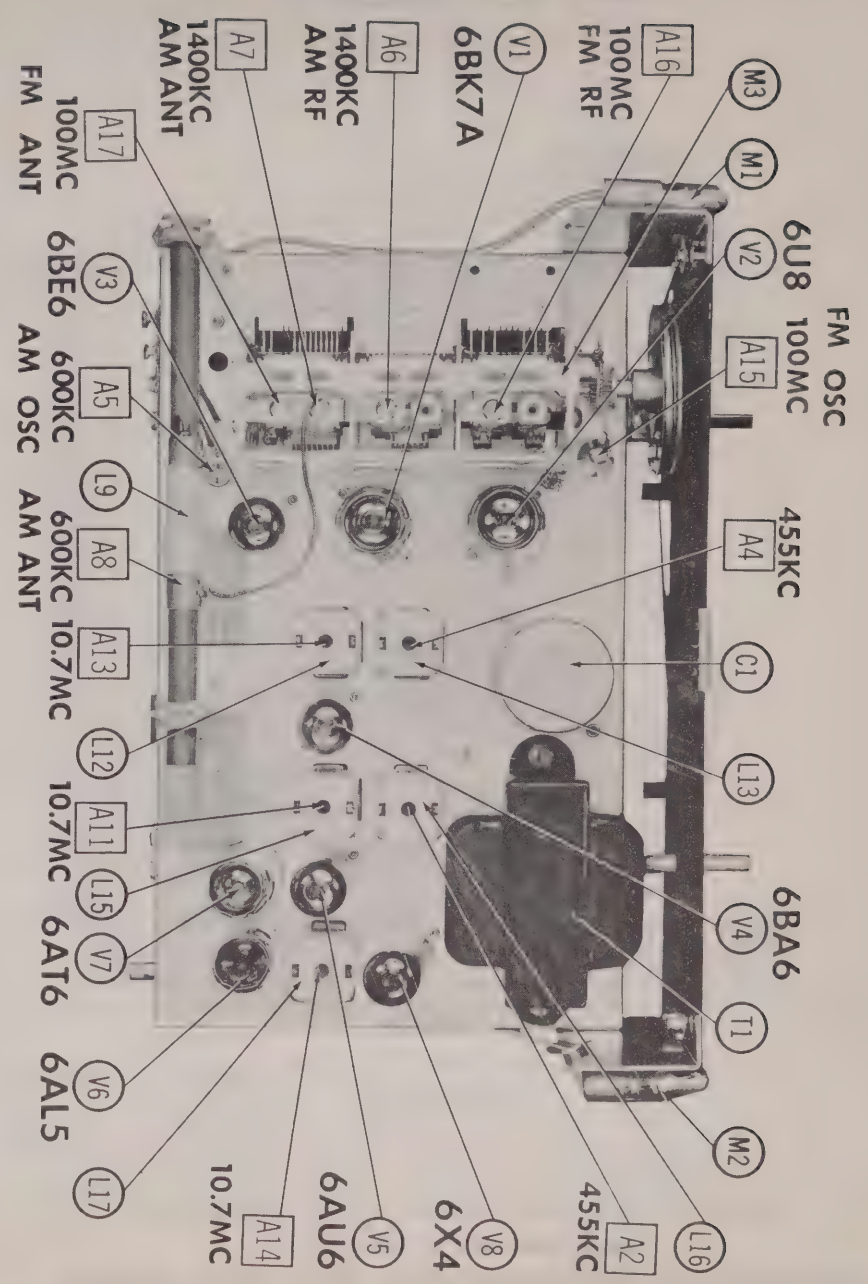
Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA Stromberg-Carlson PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C3	47			SI 47	D6-470	LT6Q47	GP-47	UC-5447	5GA-Q47	
C4	100			SI 100	D6-101	LT6T1	GP-100	UC-531	5GA-T1	
C5	1000			BPD-001	DD-102	BYA6D1	ED-1000	DC521	5HK-D1	
C6	330			BPD-00033	DD-331	L10T33	ED-330	UC-5333	5GA-T33	
C7	4.7			NPO-SI 4.7	TCZ-4R7	C10V47C	TCO-4.7	ZT-5547	5TCCB-V47	
C8	33			SI 33	D6-330	LT6Q33	GP-33	UC-5433	5GA-Q33	
C9	100			SI 100	D6-101	LT6T1	GP-100	UC-531	5GA-T1	
C10	10			NPO-SI 10	TCZ-10	CTA6Q1C	TCO-10	ZT-541	5TCC-Q1	NPO
C11	10			N750-SI 10	TCN-10	CTA6Q1U	TC7-10	NT-541	5TCU-Q1	N750
C12	10			NPO-SI 10	TCZ-10	CTA6Q1C	TCO-10	ZT-541	5TCC-Q1	NPO
C13	3-10		110853-000							
C14	2.2			NPO-SI 2.2	TCZ-2R2	C10V22C	TCO-2.2		5TCCB-V22	
C15	1000			BPD-001	DD-102	BYA6D1	ED-1000	DC521	5HK-D1	
C16	1000		110893-000	EF-001	MFT-1000				503C-D1	
C17	1000		110893-000	EF-001	MFT-1000				503C-D1	
C18	10000			BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C19	100			SI 100	D6-101	LT6T1	GP-100	UC-531	5GA-T1	
C20	330			SI 330	D6-331	LT6T33	GP-330	UC-5333	5GA-T33	
C21	10			N750-SI 10	TCN-10	CTA6Q1U	TC7-10	NT-541	5TCU-Q1	N750
C22	100			SI 100	D6-101	LT6T1	GP-100	UC-531	5GA-T1	
C23	10000			BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C24	10000			BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C25	10000			BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C26	5000			BPD-005	DD-502	BYA10D5	ED-005	DC525	5HK-D5	
C27	10000			BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C28	330			BPD-00033	DD-331	L10T33	ED-330	UC-5333	5GA-T33	
C29	330			BPD-00033	DD-331	L10T33	ED-330	UC-5333	5GA-T33	
C30	330			BPD-00033	DD-331	L10T33	ED-330	UC-5333	5GA-T33	
C31	1000			BPD-001	DD-102	BYA6D1	ED-1000	DC521	5HK-D1	
C32	10000			BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C33	10000			BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C34	5000			BPD-005	DD-502	BYA10D5	ED-005	DC525	5HK-D5	

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA Stromberg-Carlson PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1meg	½	145209-000	BX-69	A47-1meg-Z	B13-137	TA16A	Volume
B	Shaft			Not Req.	FKS-1/4	TM2-Kit	Not Req.	

CHASSIS—TOP VIEW



STROMBERG-CARLSON MODEL SR-403B

STROMBERG-CARLSON MODEL SR-403B

PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	Stromberg-Carlson PART No.	NOTES
R2	470K			
R3	10meg			
R4	220K			
R5	4700Ω			
R6	120Ω			
R7	1000Ω			
R8	1000Ω			Note 1
R9	2.2meg			
R10	22K			
R11	1000Ω			
R12	2.2meg			
R13	1000Ω			
R14	68Ω			
R15	1000Ω			
R16	68Ω			

ITEM No.	RATING OHMS	RATING WATT	Stromberg-Carlson PART No.	NOTES
R17	68Ω			
R18	1800Ω			
R19	6800Ω 5%			
R20	1000Ω 5%			
R21	6800Ω 5%			
R22	470K			
R23	68K			
R24	220K			
R25	220K			
R26	47K			
R27	10meg			
R28	100K			
R29	47K			
R30	470Ω	2		
R31	100Ω	1		

Note 1. Some versions may use 120Ω in this application.

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	REPLACEMENT DATA Stromberg-Carlson PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V @ .41A	330VCT @ .055A	6.3V @ 3.3A	161457-000						

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA Stromberg-Carlson PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1	FM Ant. Coil	114191-000					
L2	Neut. Coil	114193-000	19-1002	BC-563	4606	VP-9	1.7 Microhenries
L3	RF Choke	114693-000	19-1002	BC-563	4606		2.2 Microhenries, IRC part #CLA
L4	RF Choke	114693-000	19-1002	BC-563	4606		2.2 Microhenries, IRC part #CLA
L5	FM RF Coil	114191-000					
L6	Cathode Choke	114729-000		BC-560	4588		.47 Microhenry, IRC part #CLA
L7	FM Osc. Coil	114190-000					
L8	RF Choke	114693-000	19-1002	BC-563	4606		2.2 Microhenries, IRC part #CLA
L9	Loop Stick	139074-000					
L10	AM Ant. Coil	114165-000		BC-549	6302		2.5 Millihenries
L11	AM Osc. Coil	114188-000	14-1055		70-OSC		
L12	1st. FM IF	114363-000	16-3487	FM-254	1463		
L13	1st. AM IF	114364-000	16-6758	BC-352	12-C1	RF-1	
L14	Fil. Choke	114707-000		BC-560	4588		.47 Microhenry, IRC part #CL-2
L15	2nd. FM IF	114363-000	16-3487	FM-254	1463		
L16	2nd. AM IF	114453-000	16-6770	BC-355	12-C6		
L17	Ratio Det.	114485-000	17-3498	FM-255	1465		

MISCELLANEOUS

ITEM No.	PART NAME	Stromberg-Carlson PART No.	NOTES
M1	Dial Lamp		#47
M2	Dial Lamp		#47
M3	Tuning Cap.	110065-000	5Gang (AM:Ant. 30-335mmf, Osc. 13-129mmf)
M4	Switch	158064-000	Function (Rotary, wafer type)

PARTS LIST AND DESCRIPTIONS (Continued)

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Dial Glass	122062-000	
Dial Bezel	125634-000	
Knob	134302-000	Tan, large
Knob	134306-000	Tan, small with dot
Dial Pointer	144603-000	

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

WOLLENSAK
MODEL T-1500

WOLLENSAK
MODEL T-1500

GENERAL INFORMATION

The Wollensak model T-1500 is designed to record and playback two tracks of recorded material on standard width recording tape, thus affording double the recording time of a single track recording on an equal length of tape.

Recording speeds are 3 3/4 inches per second and 7 1/2 inches per second. Recordings can be made from a microphone, phonograph, radio, or TV receiver.

The recorder is a complete recording and playback unit by itself, having a self contained speaker. Provisions are also made whereby the output from the preamp jack can be fed to an existing home music system, or an external speaker can be connected to the External Speaker jack.

Supplied by:

Wollensak Optical Co.,
320 E. 21 st. Street
Chicago, 16, Illinois

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HOWARD W. SAMS & CO., INC., INDIANAPOLIS, INDIANA

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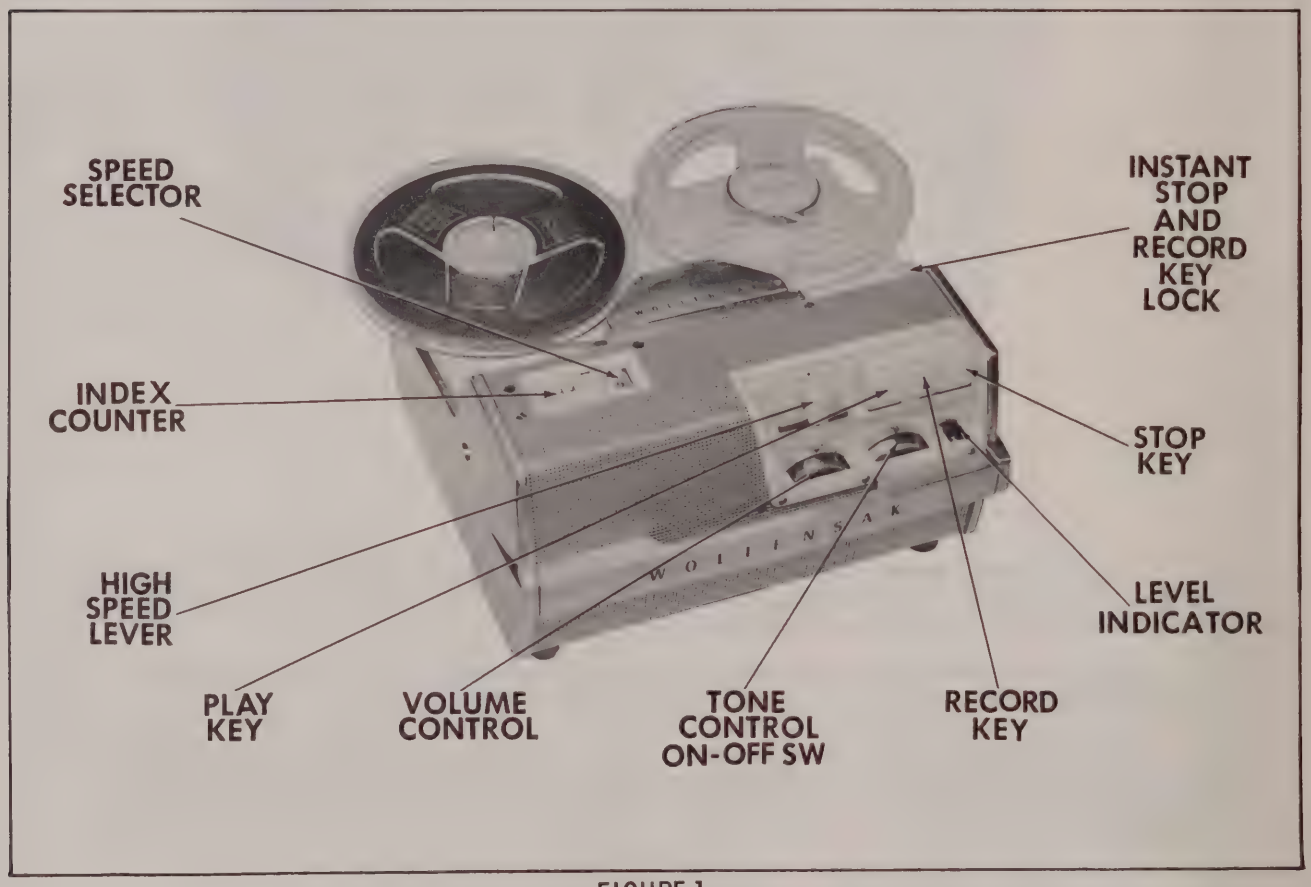


FIGURE 1

SPECIFICATIONS

Frequency Response — 40 to 15000 cps. ±3db at 7 1/2 ips.
40 to 8000 cps. ±3db at 3 3/4 ips.

Wow and Flutter — both speeds — less than 0.3%.

Signal to noise ratio — greater than 48 db.

Playing Time — 3 hours with 1 mil tape, 7" reel, at 3 3/4 ips.
1 1/2 hours with 1 mil tape, 7" reel, at 7 1/2 ips.
1/3 less time with regular (1 1/2 mil) tape.

Power requirements — 105 to 120 volts, 60 cycles.

Power consumption — 100 watts.

Size — approximately 6 1/2" x 10 1/4" x 11 3/4".

Weight — 20 lbs.

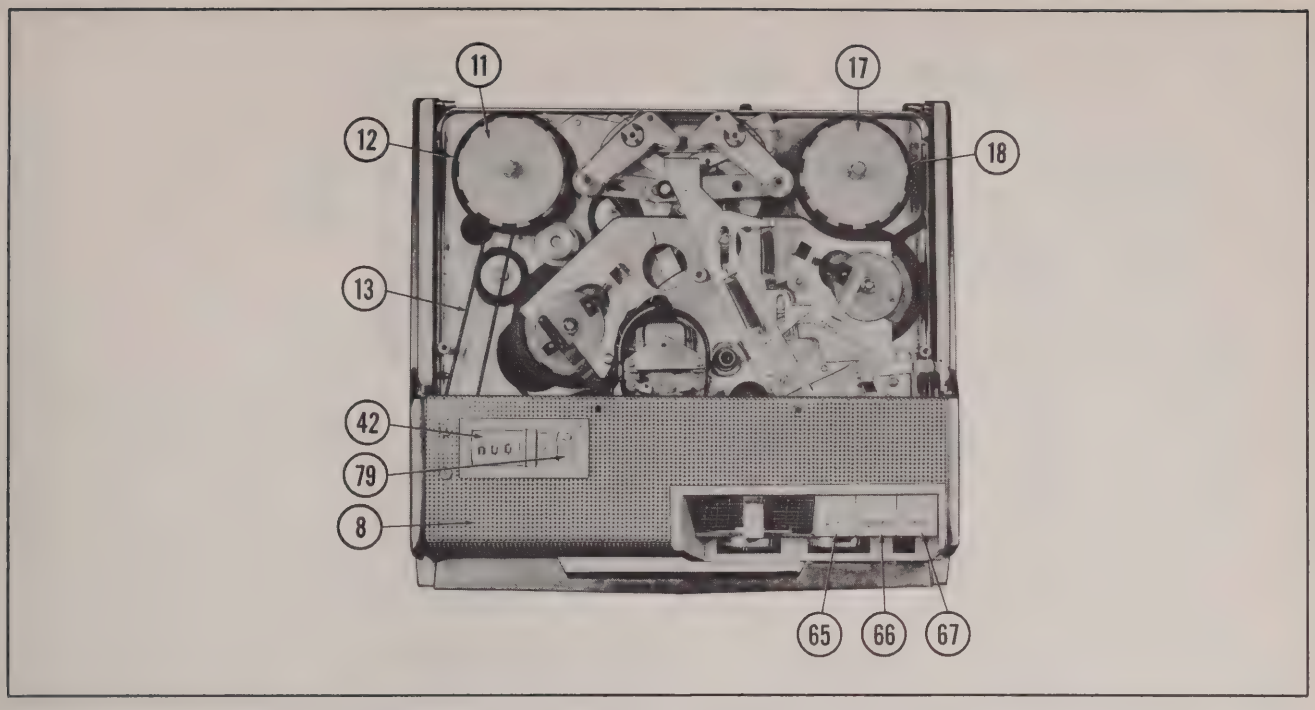


FIGURE 2 TOP VIEW WITH COVER PLATE REMOVED.

FUNCTIONS OF CONTROLS, INDICATORS, & SWITCHES

On-Off Switch

This switch is moved to the "On" position by the first few degrees of clockwise rotation of the tone control. When the switch is on, power is applied to the amplifier and the transport motor. Thus the motor is ready to transport the tape immediately whenever the PLAY or RECORD keys are pressed or whenever the HIGH SPEED LEVER is actuated.

Volume Control

The control regulates the volume during recording and playback. It is also effective in regulating the signal level applied to a separate sound or music system through the Preamp output jack.

Tone Control

The tone control adjusts the relative strength of the Bass, Middle, and Treble frequencies of the program material. Adjustment of the tone control affects the playback but does not affect the signal being record. In BALANCED TONE position the very high and very low tones are emphasized. The degree of emphasis varies with the VOLUME setting, being less at higher volume settings. This gives a response which follows closely the normal hearing pattern of the listener.

In BASS position the highs are subdued and the lows are emphasized. In TREBLE position the higher frequencies are emphasized. HI-FI position produces a response suitable for use in connecting the recorder to auxiliary equipment.

Function Keys

Mechanical and electrical functions relating to Play and Record operations are controlled by the function keys. This means that in addition to starting or stopping the tape, the proper electrical circuits are switched in or out when the Play, Record, or Stop keys are pressed.

High Speed Lever

Moving the high speed lever to the right causes the tape to advance at a much higher speed than during normal record or playback operation. When the lever is moved to the left, tape is rewound onto the supply reel. The high speed lever can be moved when the recorder is in any function (Play, Record, or Stop) and the Play or Record keys will be automatically released. When the lever is returned to neutral the recorder is left in the Stop position.

Record Key Lock — Instant Stop Lever

The record key lock is provided as a safety feature to prevent accidental erasure of pre-recorded tape. It must be pulled towards the front of the recorder and held there before the record key can be operated. It also serves as an instant stop lever when the tape is in motion during record or playback. When the instant stop lever is pulled towards the front of the recorder the tape drive is disengaged and the tape stops instantly. The recorder returns to its previous operation when the lever is released.

Record Level Indicator

During recording operations the left or "Normal" half of the indicator flashes to indicate a correct volume level and the right or "Distorted" half flashes if the volume setting is too high. If the volume level is preset for recording before the Record key is pressed, the tone control should be turned to "Treble". However, after the Record key has been pressed the tone control adjustment has no effect.

Record Mike — P.A. — Monitor Switch

This is a slide switch mounted on the rear of the recorder. When the switch is in the Record Mike position the speaker does not operate when either the Record or Stop keys are depressed. This is also true of any speaker which may be connected to the speaker

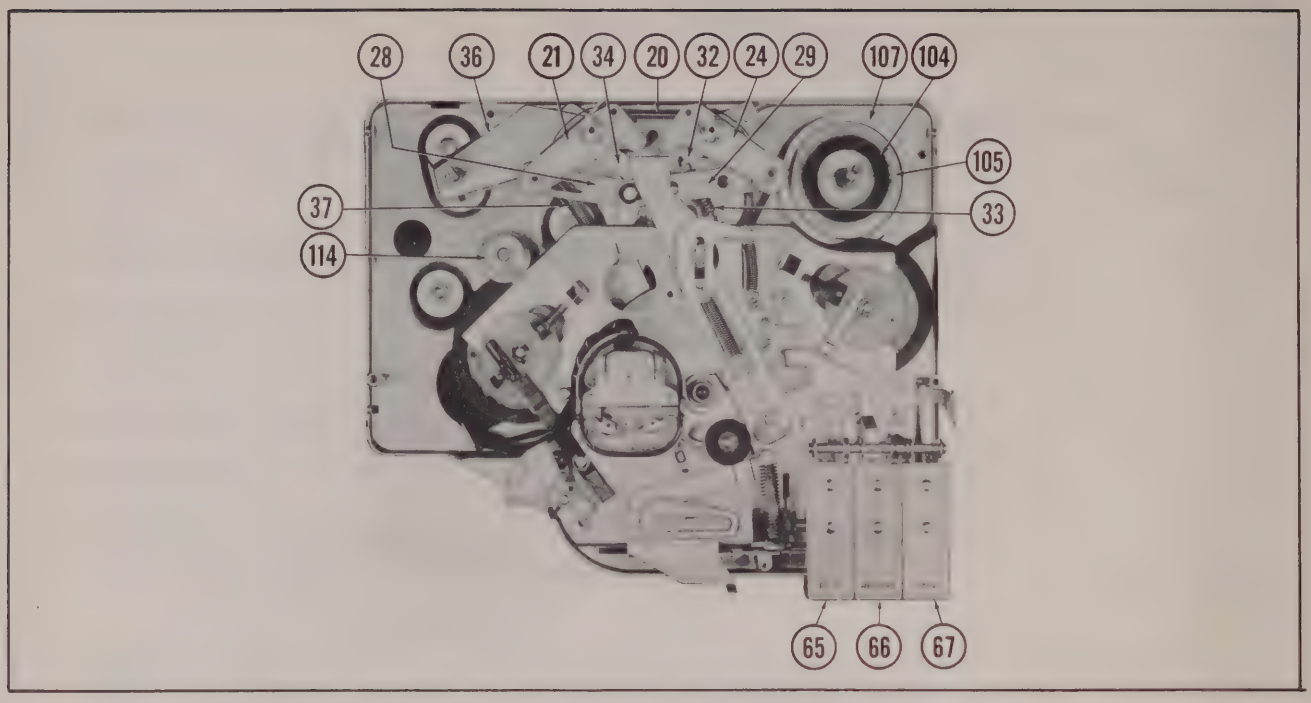


FIGURE 3. TOP VIEW OF TRANSPORT MECHANISM REMOVED FROM CASE.

output jack at the time. When the switch is in P.A. — Monitor position the speaker is connected so that the recorder can be used as a P.A. System, or so that the program material can be monitored as it is being recorded. The switch has no effect when the recorder is in the Play mode.

Automatic Release For Storage

When the power ON-OFF Switch (on the Tone Control) is turned off, the Record or Play key is automatically released, thereby disengaging pressure pads and rubber rollers for safe storage of the instrument.

Speed Selector

The speed selector is mounted near the index counter at the left front of the instrument. The selector is pushed to the rear or the front for either 7 1/2 or 3 3/4 ips. The speed being used appears on the speed selector dial. The recorder does not need to be stopped in order to change speeds. Rapid Forward winding can be accelerated by setting the speed selector to 7 1/2 ips.

Index Counter

The counter can be set to zero by turning the knurled knob toward the rear of the recorder. Zero the counter when starting to record or playback a reel of tape. If the reading of the counter is noted at various points in the tape travel, new program selections can be indexed or previously recorded selections can be reached with great accuracy.

Input Jack

The input jack can be used to connect a microphone or radio-phono combination to the recorder. The proper input circuit is automatically selected by means of different plug lengths for each application. The shorter (1") plug is used with the microphone and a 1 3/16" plug is used for the radio-phono connection.

External Speaker Jack

An external speaker can be connected to the recorder by means of this jack. The nonimal impedance of the speaker should be 8 ohms, but speakers of impedances ranging from 3.2 to 16 ohms may be used with only a slight loss of power. Accessories such as the TE-401 ear phone or any head phones may be used. The internal speaker of the recorder is disconnected when a plug is inserted into the external speaker jack.

Pre-Amp Output Jack

The pre-amp output is provided for direct connection to Hi-Fi systems. DC voltages are blocked from the output by a .1mfd. capacitor. The output impedance is approximately 33K ohms.

OPERATING INSTRUCTIONS

Connect the power cord to an electric outlet and the power socket in the rear of the recorder. Make sure that the high speed lever is in the center or neutral position, then turn the recorder on by means of the ON-OFF switch on the TONE CONTROL.

Threading The Tape

Press the stop key. Place a full reel of tape (glossy side out, i.e. "A" wind) on the left spindle. Pull a length of tape off the supply reel and lower it into the threading slot. Attach the end of the tape to the empty take-up reel. Set the index counter to zero for reference.

Recording With A Microphone

Insert the microphone plug into the input jack at the rear of the recorder. Set the slide switch to Record Mike. Select the desired tape speed by means of the speed selector (7 1/2 or 3 3/4 ips.).

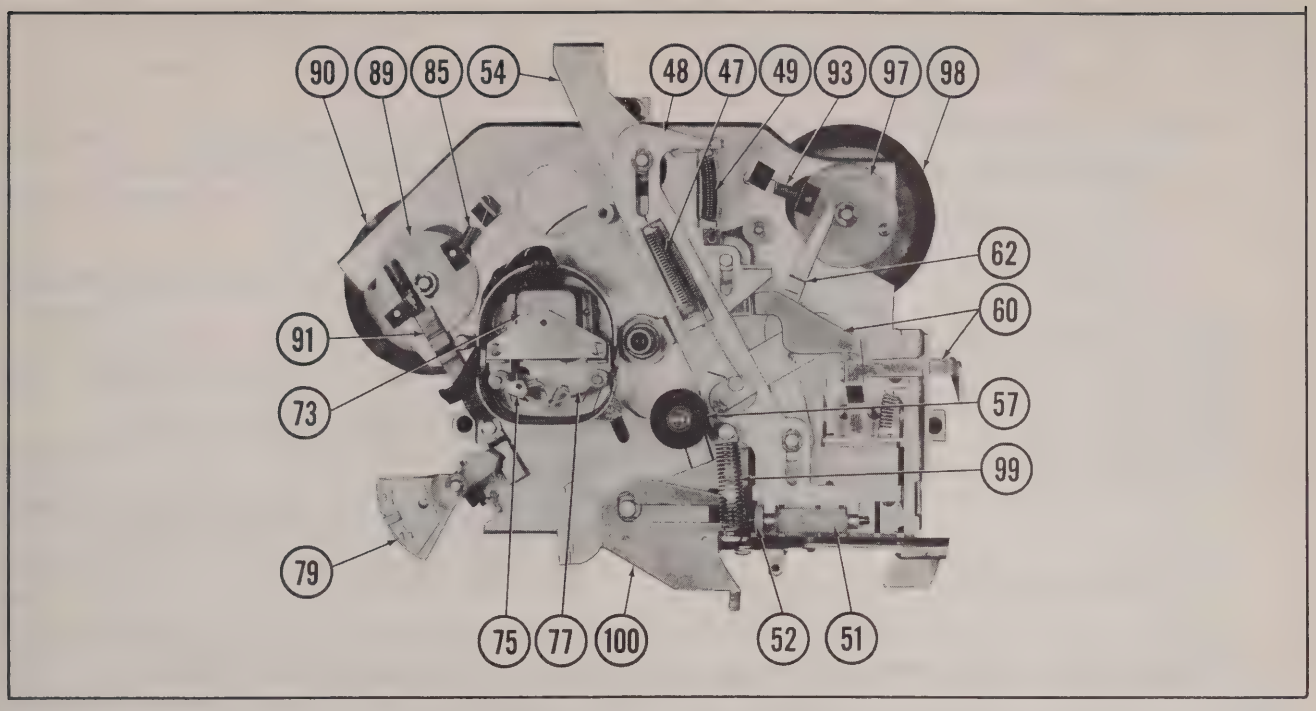


FIGURE 4. TOP VIEW OF TOP MECHANISM PLATE ASS'Y.

If it is desired to set the record level before the tape is set in motion, turn the tone control to Treble and adjust the volume control until the "Normal" half of the indicator flashes and no flashing occurs at the distorted half.

Pull back the Record Key Lock - Instant Stop lever and press the Record key. Release the Instant Stop lever and recording will be started. When the recording is finished, press the Stop key.

The signal can be monitored during recording if the slide switch on the rear panel is set to P.A. MONITOR. However care should be used to keep the microphone away from the speaker or acoustic feed back may cause squealing. This danger can be avoided if earphones are used instead of the speaker. The earphones should be plugged into the external speaker socket. When the recording is completed the tape can be rewound by moving the high speed lever to the left.

Playback

When the tape has been moved to the desired starting point, press the PLAY key and adjust the volume and tone control to suit. The Wollensak model T-1500 is a twin track recorder. When the end of one track is reached and it is desired to record or playback on the other track take the full reel from the right spindle, turn it over, place it on the left spindle and rethread the machine.

Erasing Tape

Any pre-recorded material is automatically erased as new material is recorded. Erasure is accomplished only when the Record key is down. To erase without recording new sound, turn the volume control all the way down and press the Record key.

Playback Through An External Hi-Fi System

A Pre-Amp output is provided for direct connection to Hi-Fi systems. Run a shielded cable such as the Wollensak A196-13 Hi-Fi cable from the Pre-Amp output on the back of the recorder to the proper input on the external amplifier. Such inputs are commonly marked, "Auxiliary", "T.V.", "Tuner" or "1V input". Set the recorder's tone control to "Hi-Fi" and adjust the volume until the Normal indicator flashes. Thereafter adjust the volume and tone controls of the external amplifier to suit.

Recording From An External Amplifier

Recordings can be made from external sources such as Phonographs, Radios, TV's and AM-FM tuners. The outputs from these sources are commonly marked "Detector", "Tape", "Recorder Input" or "Pre-Amp Output". Use an A196-13 Hi-Fi cable or similar cable to connect this output from the external amplifier to the Microphone-Phono-Radio input of the recorder. If the external amplifier has a level control for the output jack being used, it should be set so that the recorder volume control will be somewhere near its midrange for proper operation of the indicator lamp. Tone controls and loudness controls on the external amplifier should be set as nearly as possible to feed a flat output signal to the recorder.

Public Address System

Press the Stop key of the recorder and set the slide switch to P.A. — Monitor. Plug the microphone into the input jack and the external speaker or speakers into the External Speaker jack. Keep microphone and speakers separated as far as possible to avoid feedback and howling.

Splicing And Editing

Tape from a dual track recorder can be edited if only one track has been recorded or if the program on the other track can be sacrificed. Undesirable portions can be cut out, announcements can be inserted between selections, etc. Unused sections of tape can then be spliced together and re-used. Tape should be cut on a diagonal and the ends joined together with

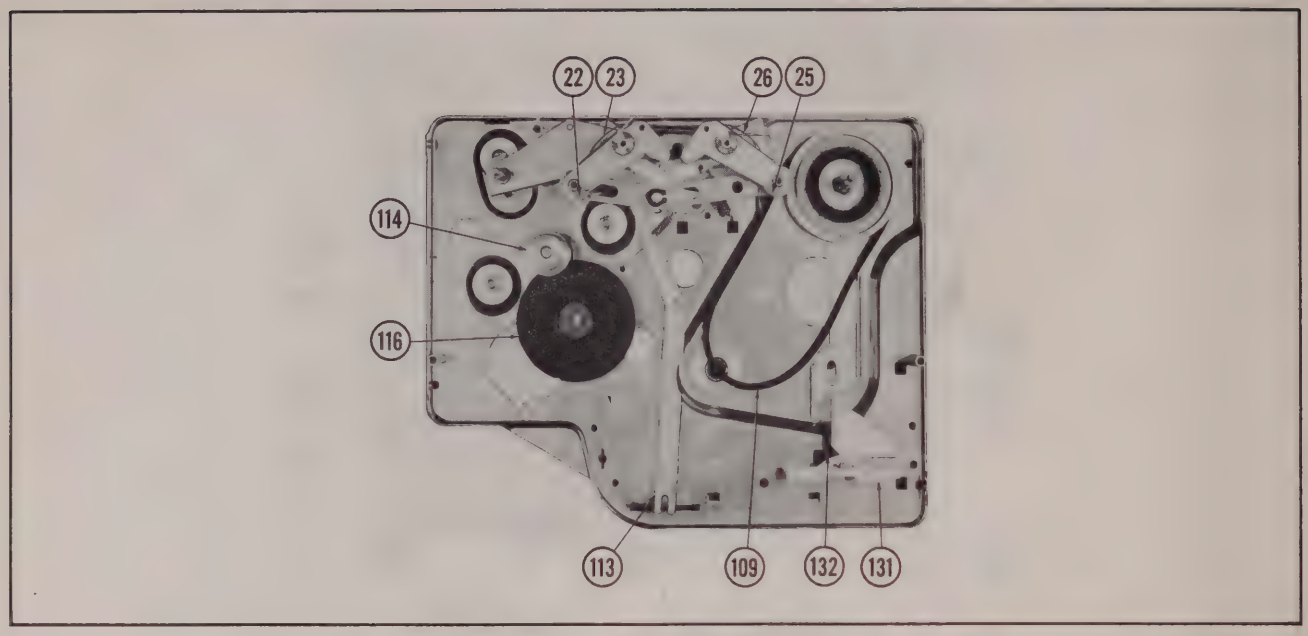


FIGURE 5. TOP VIEW OF TRANSPORT MECHANISM WITH TOP MECHANISM PLATE REMOVED.

splicing tape on the glossy side. Any excess width should be trimmed.

Program material can be edited very precisely in the following manner:

1. Press "Play" key and stop the tape with the Instant Stop lever. Turn the reels by hand to locate the word or sound.

2. Remove the head covers and mark the tape at the right hand element in the black slot of the sound head.

3. Remove the tape from the threading slot and cut at the mark.

DISASSEMBLY INSTRUCTIONS

To Remove Mechanism From Case

1. REMOVE TOP PANEL

A. Remove 5 painted screws holding top panel (3 screws between reel spindles and 1 on each forward corner.)
B. Remove 2 chrome plated screws on top of perforated grill directly in front of head cover.
C. Remove forward head cover bar, by pulling up.
D. Carefully pry up top panel at the rear enough to just clear the reel spindles; pull it back to remove.

2. Remove bottom cover by removing 8-screws; 4-screws in line with, and inside front rubber feet; 2-screws on side panels 1/2" above rear feet; 2-screws 1" to the side of the top cover hinges. Remove bottom cover.

3. Remove counter belt from counter pulley.

4. Remove high speed knob, by pulling up.

5. Remove the three remaining Phillips head screws from each side panel. Remove side panels.

6. Remove speaker plug from amplifier chassis and slide mechanism away from control panel.

To Remove Amplifier From Transport Mechanism

1. Unplug motor plug.

2. Unplug head plug.

3. Remove nylon function switch arm from bottom of amplifier by pulling off.

4. Remove four Phillips head screws (3-long, 1-short) from bottom of amp. chassis holding each corner. Lift amplifier chassis away from tape transport mechanism.

To Remove Amplifier Without Complete Disassembly

1. Turn Speed Selector to 7 1/2 I.P.S. Remove bottom cover and right side panel as outlined above.

2. Pull the nylon Function Switch Arm out of the chassis bottom.

3. Unplug the Head Plug, Motor Plug, and Speaker Plug.

4. Remove the four Phillips Head Screws holding the chassis corners to the mechanism.

5. Note the position of the plastic insulator between chassis and mechanism. Lift chassis up and to the right to remove.

NOTE: When reassembling, make sure mechanism is in 7 1/2 I.P.S. position and nylon chassis insulator is in place.

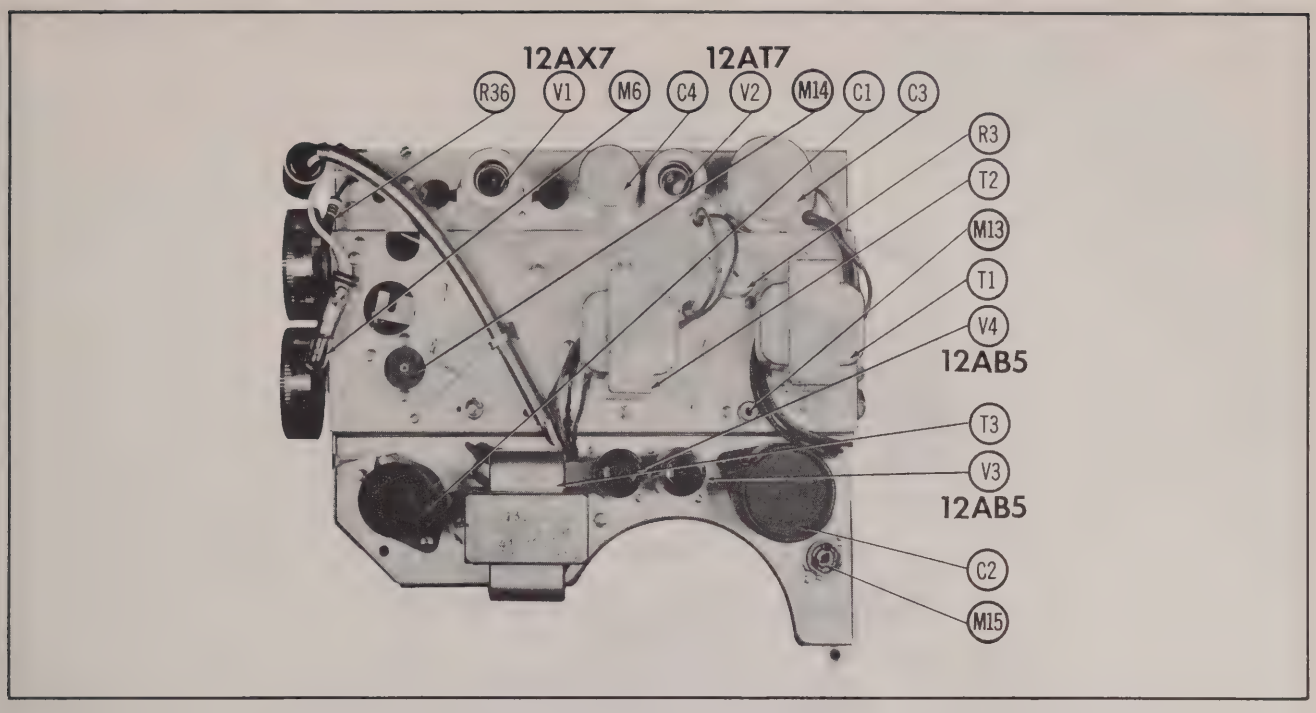


FIGURE 6. TOP VIEW OF AMPLIFIER.

PRELIMINARY TESTS – REPAIR PROCEDURE

TEST PROCEDURE: FAILURE TO PASS ANY OF THESE TESTS INDICATES A FAULT THAT SHOULD BE REMEDIED.

1. Remove front and rear head covers by pulling up. Clean head, tape guides, and capstan with alcohol.

2. Press "Stop" key. Place high speed knob in the middle or neutral position. Place on-off switch in the "On" position.

3. Thread tape on recorder. Brakes should be engaged. Pull required on reel should not distort the tape and should offer sufficient drag to prevent spilling of tape. Drop tape into threading slot. Attach free end of tape to take-up reel (right). Reel should rotate freely counter-clockwise and drag when rotated clockwise.

4. Press "Play" key, key should latch down. "Stop" key should release. Reel spindle brakes should release. Felt pressure pads should press square against tape and cover shiny pole face area under tape. Pressure roller (57) should contact capstan, and tape should move past play-record-erase head (73) at playing speed. Take-up reel should wind up tape as it passes the capstan. The counter should tally each revolution of the supply reel.

5. Move high speed knob to the right. Check to see that moving the knob releases "Play" key. Pressure roller and pressure pads should be released. Tape should move forward at greatly increased speed.

6. Return high speed knob to the middle or neutral position. Pressure pads and roller should remain disengaged. There should be no spilling of tape.

7. Make a microphone recording. Adjust "Volume" control while speaking so that "Normal" indicator flashes and "Distorted" indicator does not.

8. Move high speed knob to the left. "Record" key should release.

9. Play back recording. Check volume, tone, and overall quality.

10. Rewind tape and re-record over your previous recording. All trace of previous recording should be erased on the portion of the tape re-recorded. Check irregularities in playing speed (Wow and Flutter). Check the action of the instant stop arm (60). Tape should stop instantly. Upon releasing, tape should start instantly and not spill off reels.

REPLACING SOUND HEAD

1. After removing head spring retainer (71) lift head and brass alignment plate from head shield cup. Unplug head cable plug.

2. Pry head from brass alignment plate. Note position of location pins.

3. Place the head over the pins in the aligning plate in the proper location and press into place.

4. Replace alignment plate into head cup. The two brass pivot studs should engage the two holes in the plate. Replace head retaining spring.

5. Align head azimuth as described in electrical adjustments.

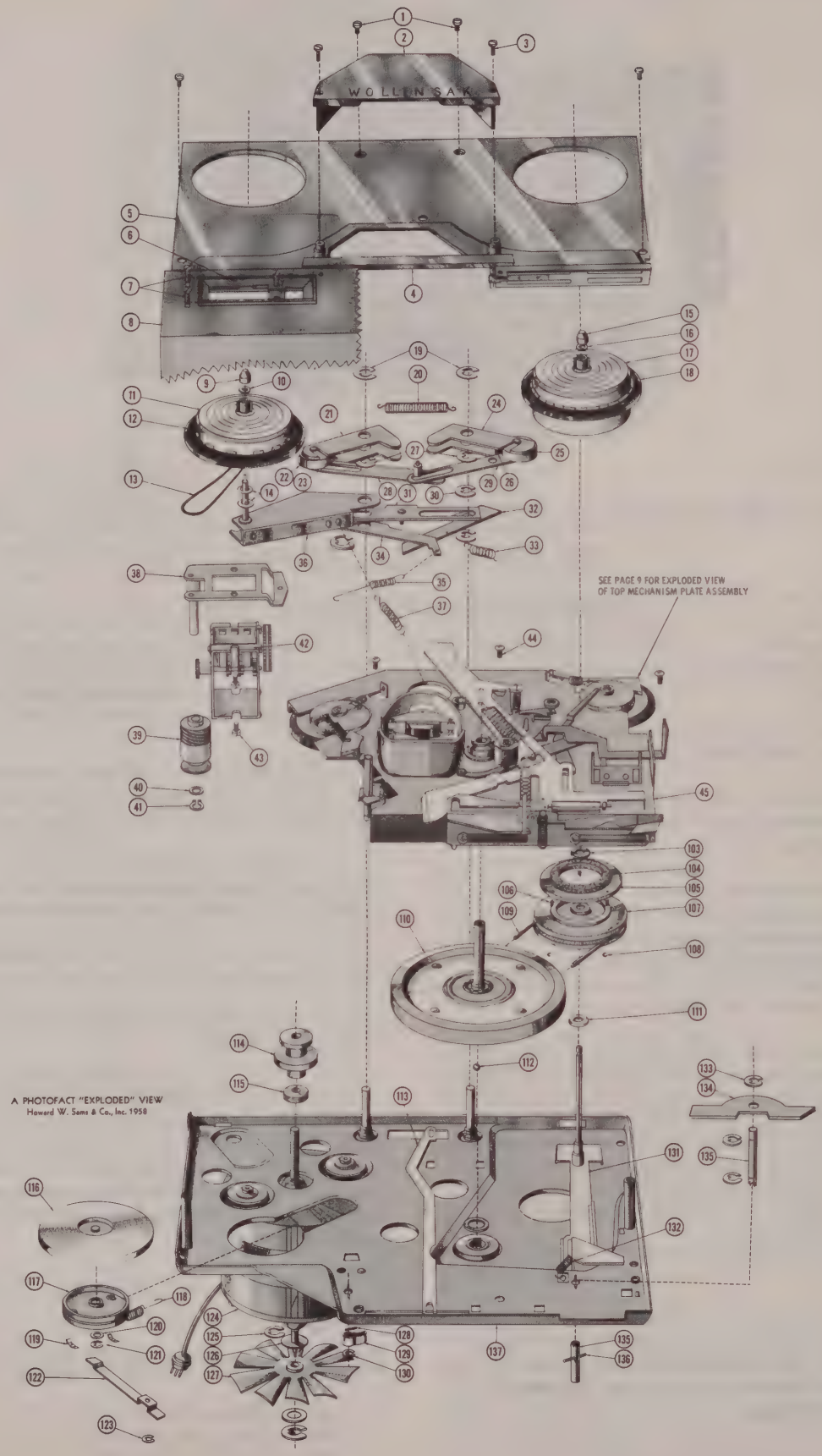

WOLLENSAK
SEE PAGE 9 FOR EXPLODED VIEW OF TOP MECHANISM PLATE ASSEMBLY
A PHOTOFACT "EXPLODED" VIEW
Howard W. Sams & Co., Inc. 1958

FIGURE 7. EXPLODED VIEW OF TRANSPORT MECHANISM

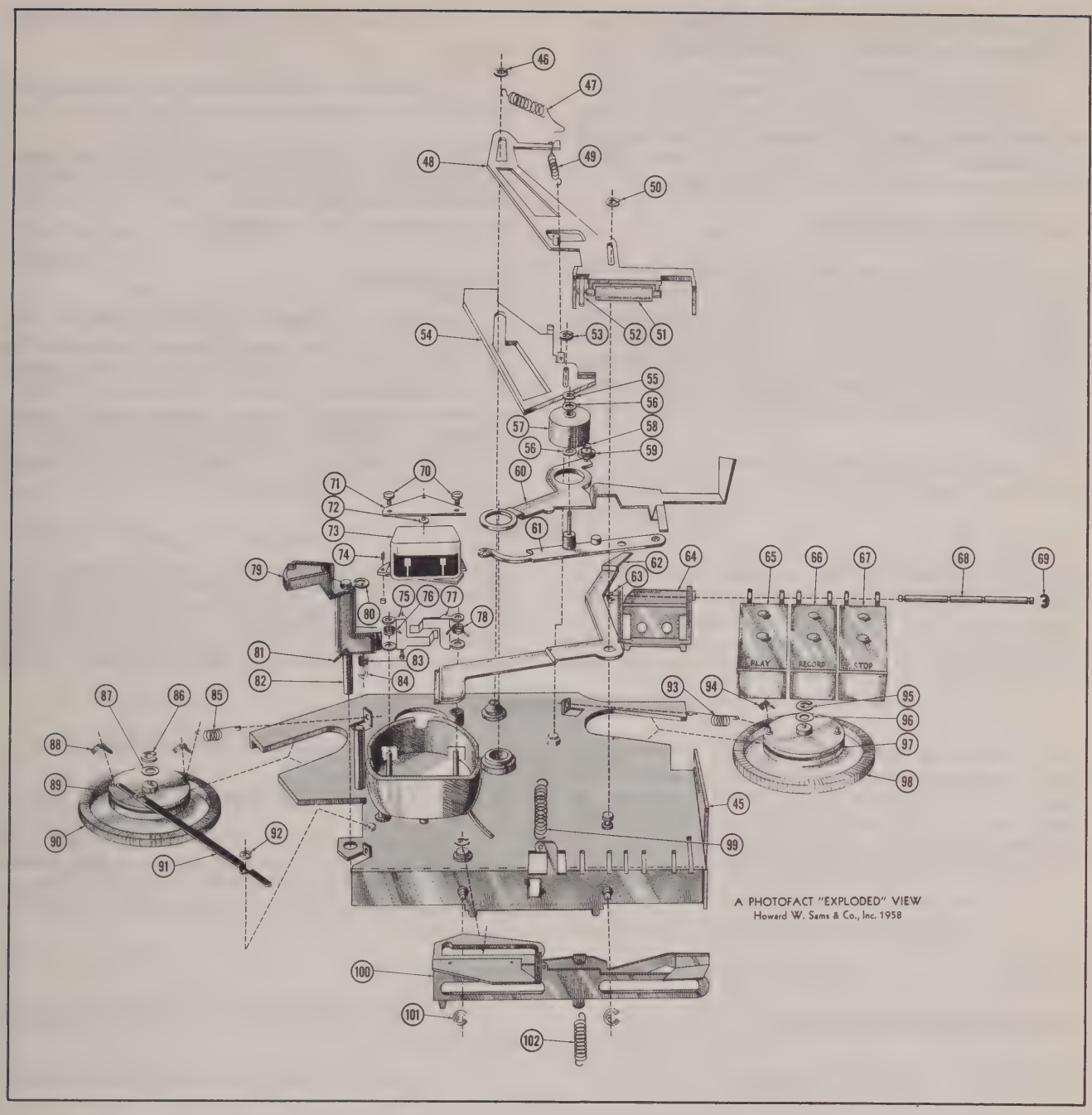


FIGURE 8. EXPLODED VIEW OF TOP MECHANISM PLATE ASSEMBLY.

ELECTRICAL ADJUSTMENTS

Play-Record-Erase Head Azimuth Adjustment

It is important that the head be lined up so that the record-playback gap is at a 90 degree angle with respect to the direction of tape travel. If the head is misaligned there will be some loss of the higher frequencies and a lower output in general will result. The azimuth adjustment is made as follows:

A 1 mil alignment tape should be used. Thread the tape in normal manner and set the controls to "Play" position. Adjust the head for maximum output by turning the adjustment screw (Item 74 on the Exploded View). In lieu of an alignment tape, play a previously recorded tape and adjust the head for maximum treble tone. After the adjustment is made, cement the alignment screw (74) to lock the adjustment.

High Frequency Equalization Adjustment

An adjustment is provided in the cathode circuit of V2A (12AT7) to compensate for high frequency losses which accompany long term head wear. This equalization has more effect upon the playback than it has upon the recording process; therefore, the adjustment is made for best results during playback.

The equalization adjustment has been properly made at the factory and should not require readjustment for at least 500 hours of use. Before any adjustment is made, the heads should be carefully cleaned with alcohol. Make the adjustment in the following manner:

1. Record signals of equal amplitude at 10kc and 15kc, well below (-15db) normal level.

2. Set the controls for HI-FI playback and measure the two signals at the PRE-AMP output.

3. Adjust the core of the peaking coil (L2) for 6db more output at 10kc than at 15kc. The core has a threaded shaft which is accessible from the tube side of the chassis. The shaft is located near hum control (R3), between transformers (T1) and (T2).

Hum Balancing Adjustments

Two hum balancing controls, R3 and R4, are provided for maximum reduction of hum. These controls have been properly adjusted at the factory for optimum performance. R3 is located near the high frequency peaking coil (L2) mentioned in preceding paragraphs. R4 is located at the opposite end of the chassis and is accessible through a small hole near the record level indicator.

Make the hum balancing adjustments in the following manner:

1. Set the slide switch (M9) on rear of chassis to "P.A."

2. Reduce the VOLUME setting to minimum and adjust R3 for minimum hum.

3. Advance the VOLUME setting to maximum and adjust (R4) for minimum hum. If (R4) adjusts for minimum hum at one end of its rotation, leave the volume at maximum and readjust (R3).

Bias Adjustment

The bias is measured by placing a 100 ohm resistor in series with the record element and measuring the voltage across this resistor with a meter capable of accurately reading 0.15 Volts at a frequency of 70KC. Adjustment is made by means of the screwdriver adjustment on oscillator coil (L1). The above value of bias will produce optimum results on most types of standard tape presently available.

CLEANING

The majority of defects, other than wear or breakage, can be traced to dirty surfaces. The play-record-erase head (73), capstan, and pressure roller (57) are subject to an accumulation of tape coating residue, which is worn off the tape as it passes these parts. This accumulation should be periodically removed since it will cause faint recording and poor playback. Wipe off the above surfaces carefully with a clean cloth. If dirt is caked or hard and will not come off with a dry cloth dampen cloth slightly with alcohol.

LUBRICATION

All moving parts in this recorder were permanently lubricated at time of manufacture. Under normal use further lubrication should not be required. In heavy-duty service, the following parts should be lubricated once a year with a drop of #10 motor oil:

1. The top and bottom motor bearings.
2. The top and bottom flywheel (110) bearings.
3. Pressure roller (57) bearing.
4. All idler and drive wheel bearings.
5. The reel spindle bearings.

The basic rule is — do not over lubricate. Oil must be kept off all rubber idlers, belts, and periphery of flywheel and off parts that might transfer oil to them. Always wipe excess lubricant from parts that have been lubricated.

MECHANICAL TROUBLES

No Tape Drive In Play Or Record

Check for the following possibilities:

1. Tape wound around capstan.

2. Pressure Roller Tension Spring (47) broken or disconnected so that pressure roller (57) is not held against capstan. Connect or replace the spring.

3. Instant Stop Brake Spring (49) broken or disconnected. Brakes will not release and the pull of the capstan may be sufficient to break the tape. Connect or replace the spring.

4. Idler Drive Spring (85) broken or disconnected. High Speed Idler assembly (90) will not be held against motor pulley (114) and flywheel (110). Connect or replace the spring.

5. Slow Speed Idler Spring (118) broken or disconnected and the Slow Speed Idler assembly is not held against motor pulley (114) and flywheel (110). Connect or replace the spring.

6. Motor pulley (114) loose on its shaft. Tighten motor pulley set screw.

7. Grease or oil on high or low speed idler tires.

8. Sticking idler slide.

Take-Up Reel Does Not Turn Although Tape Feeds Past The Capstan

1. Take-up belt (109) broken or off pulley (107). Replace or place back on pulley.

Take-Up Reel Stalls In Playback Or Record When Reel Is Nearly Full

1. Grease or oil on take-up belt (109) or on take-up clutch felt (104). Clean with alcohol. Replace felt if necessary.

No Fast Forward — Capstan Revolves

1. Hi-Speed Idler spring (93) broken or disconnected. Idler assembly (98) not held against fly wheel or spindle cup (17). Connect or replace spring.

Fast Forward Stalls With Full Reel

1. Grease or oil on Idler assembly tire (98).

No Rewind — Capstan Revolves

1. Rewind Spring (37) broken or disconnected. Rewind Spindle and Tire assembly not held against motor pulley (114). Connect or replace spring.

Tape Overruns Or Spills When Functions Are Changed

1. Brake Arm Spring (20) broken or disconnected. Connect or replace spring.

2. Brake roller leaf spring (23) broken or disconnected. Connect or replace spring.

Speed Irregularities (Wow And Flutter)

In general, anything which causes a drag or slipping action other than that occuring during normal operation can cause wow or flutter.

Check for binding in the following:

1. Flywheel bearings. Check by moving idler wheels (90) and (98) away from the flywheel and rotate the capstan by hand. A slight drag is normally obtained from take-up belt (109).

2. Pressure roller bearing.

3. All idler and drive wheel bearings.

4. Right and left reel spindles. The brakes should be disengaged or held away before the spindles are turned.

5. Motor bearings. Check by turning shaft by hand.

Check to see that:

1. Supply reel is free to rotate and is not scraping against the top plate.

2. Brakes are completely released.

3. Pressure roller (57) is making good contact with capstan. Pressure roller tension spring (47) should not be too weak or too strong.

4. Capstan and pressure roller are clean.

Check for irregularities in the following:

1. Idler wheel surfaces.

2. Pressure roller (57) surface.

3. Take-up tension. The take-up clutch is designed to slip during normal operation to compensate for the different rate of rotation of a full and an empty reel. Check by holding the right hand spindle while the recorder is in play position. The clutch action should be smooth and non pulsating. If the surface of the take-up clutch felt (104) is gummy or if the felt is worn it should be replaced.

Bottom Motor Shaft Pin Rubs on Bottom Ventilating Grille

1. Place washers under motor supports on side rubbing to more nearly center the motor in grille opening when recorder is in normal position.

Insufficient Tape Take Up

1. Increase take up action by adding another washer (111) under take-up pulley assembly.

2. Clutch felt (104) may be worn; replace if necessary.

Tape Squeak

Tape squeak can be caused by faulty tape with insufficient lubrication and is accentuated by high temperature and humidity.

Squeaking can be minimized by:

1. Cleaning head and pressure pads with alcohol.

2. Slightly decreasing the tension of pressure pad springs (76 and 78).

3. Use lubricated tape.

ELECTRICAL TROUBLES

Weak Playback Volume Or No High Frequencies

1. Check for faulty A123-5 rectifiers in voltage doubler power supply.

2. Check for open fuse resistors A106-12 and A106-11.

3. Check for low B+ to 12AB5 power tubes.

4. Check for dirty head (73). Clean head with alcohol.

5. Check pressure pads for wear or improper contact.

6. Wrong type of tape or wind. Dull side of tape should be wound "in" or "A" wind.

7. Check head azimuth adjustment.

8. Check head for wear. If head is worn make compensating adjustment (see High Frequency Equalization Adjustment) or replace if head wear is too great.

9. Check adjustment and condition of L2.

10. If high frequency response is lacking only at 3-3/4 I.P.S., check operation of equalization switch.

Recorder Dead, Pilot Light Off

1. Check fuse (M4). If recorder blows fuses repeatedly, check for B+ shorts; also check type of power source. Recorder should not be plugged into a DC or 220 VAC source.

2. Check power cord and on-off switch.

No Playback Or Record

1. Check tubes and voltages as indicated on schematic diagram. Trouble can be localized by monitoring output at Pre-Amp jack; if signal is present here trouble must be in some succeeding stage; if no signal is present trouble may be in preceding stages, or in B+ supply.

2. Check play-record head (Demagnetize head after an ohmmeter is used to check head).

Plays, But Does Not Record, Or Records But Does Not Play Back.

1. Check amplifier function switch nylon arm adjustment. See if switch arm moves the function switch all the way back when Play Key is pressed or all the way forward when the Record Key is pressed. The switch arm requires adjustment if pushing the switch arm by hand moves the function switch slide slightly more to the rear or front when the Play or Record Keys respectively are pressed. To make adjustment, turn the hexagon nylon cam so that its pin moves the function switch slide as far as possible, both backward and forward when the Play and Record Keys are pressed. To check if adjustment is correct, press the Stop Key; sight straight down the rear edge of the function switch 7/8 inch access hole into the amplifier. The rear edge should appear to bisect the small eyelet on the function switch slide.

2. Check for drag or binding on the function switch slide. Switch should not require more than twenty ounces to move back and forth.

3. Check recording source; microphone may be dead, or other source may be faulty.

4. Oscillator tube (V4) may be defective (if so, listener may perceive distortion in playback).

5. Check oscillator coil (L1).

Weak Or Distorted Record, Playback of Pre-Recorded Tape O.K.

1. Check oscillator tube (V4).

2. Check input jack for proper contact.

3. Check microphone or other input source for quality of signal. Also check plugs; microphone plug should be a 2 circuit plug with shielded wire connected to tip, shield connected to body. Shaft of plug should be approximately 1" long. High level sources require a 2 circuit plug approximately 1 3/16" long. Failure to push plugs all the way into jack may cause distortion.

4. Check record level indicator lamp. A defective lamp may result in a recording level which is too high or too low.

Record Level Indicator Inoperative Or Operation Defective

1. Check for defective lamp.

2. Lamp may glow continuously if there is excessive hum or if the amplifier is oscillating

3. Distorted indicator should begin to glow when 2 volts at 1,000 cycles appears at pre-amp output jack, if circuit is normal.

Hum In Record Or Playback

1. Check all stages for heater to cathode leakage in tubes.

2. Check hum controls, R3 and R4, for proper adjustment (See Hum Balancing Adjustments).

3. Check filtering action of power supply.

4. Hum on a recorded microphone signal may be due to poorly grounded shield on microphone cable. An extra long microphone cable can also be a source of hum pickup.

5. Be careful to keep recorder away from hum fields such as fluorescent lamps, amplifiers, and transformers.

Weak Or No Erase, Records Over Previous Recordings

1. Check for dirt on erase head element. Check pressure pads.

2. Check oscillator coil (L1) and oscillator tube (V4). Check erase head continuity.

Microphonic Noises

Microphonic noises usually develop in the first stages of an amplifier where the sensitivity is greatest, but can develop in other stages. Start with the first stage (12AX7) and try different tubes, selecting the one which is least microphonic.

No Sound, Neon Lamps Flashing With Signal

1. Check Speaker and Speaker Switch. Check function switch clips for contact.

2. Check transformer (T3) for open secondary.

3. Check connecting cables, jacks, or plugs in output circuit. Make sure speaker plug is pushed all the way down.

Excessive Tape Hiss

1. Check for sufficient recording level by comparing to a pre-recorded tape.

2. Check for defects in oscillator tube or oscillator circuits. A poor erase or bias wave form can cause hiss in the recorded signal.

3. Check automatic demagnetization circuit which operates by shorting the .1 mfd (C-2) across the head at the termination of the Record function. The .1 mfd condenser resonates the Record head to provide a decaying demagnetization transient.

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Preamplifier	12AX7	
V2	AF Amplifier	12AT7	
V3	Output	12AB5	
V4	Output-Bias Osc.	12AB5	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	Wollensak PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1	40	200	A119-10	AFH1-25	XA0291	FP217	TMS-31	S-140	TVL-1519
C2A	▂40	200	A119-9						R2641*
B	▲25	350							
C	■25	350							
D	20	35							
C3A	▂20	350	A119-11						R2640*
B	▲30	300							
C	■30	300							
C4A	■30	250	A119-12						R2639*
B	▲20	250							
C	50	10							

* Non Catalog Item

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

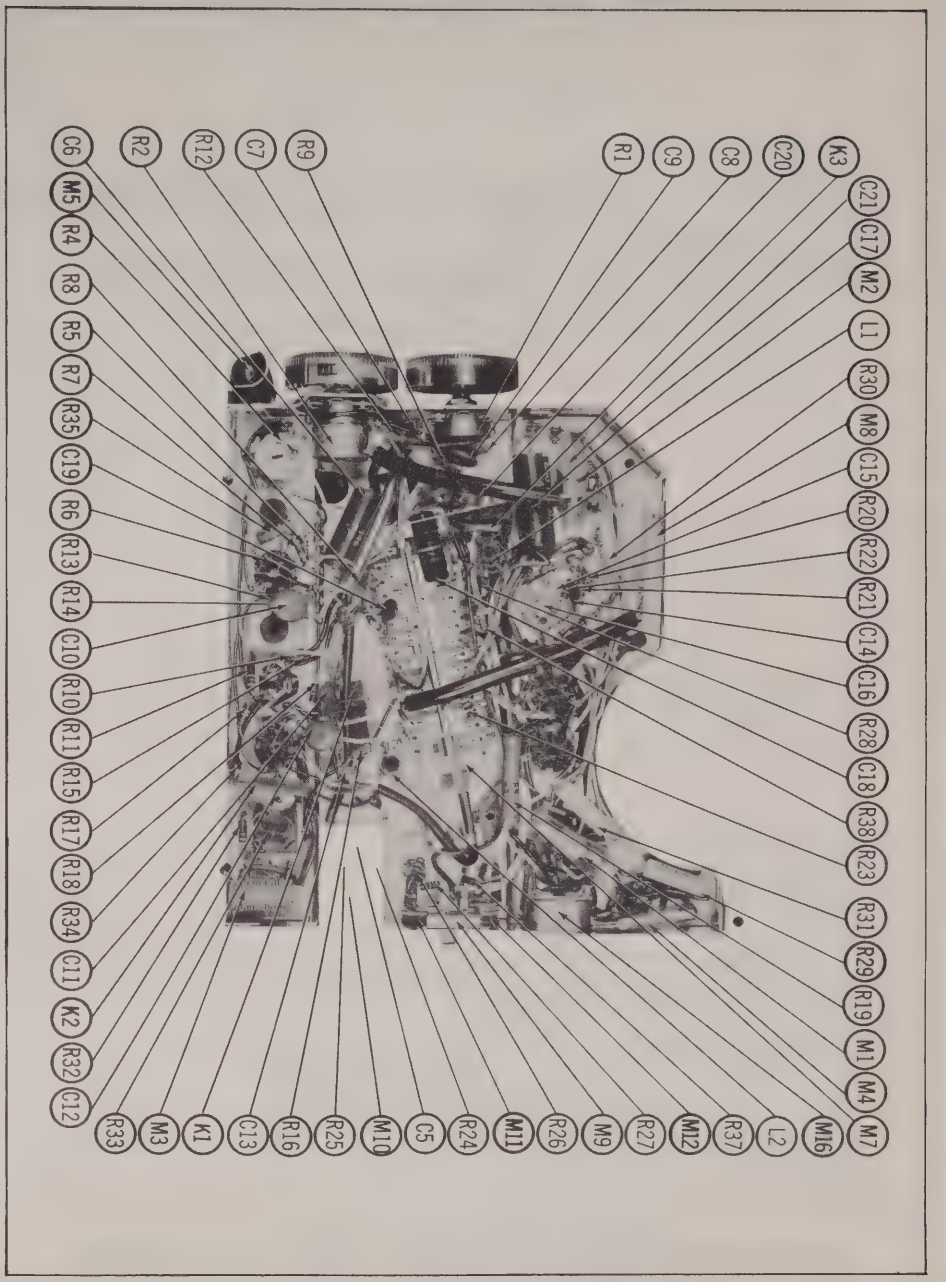
ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	Wollensak PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C5	25000		B114-10			LT6S25			TG-S25	
C6	.1	400	B115-5	P488N-1	DF-104	CUB4P1		GEM-401	4TM-P1	
C7	15000		B114-2	BPD-015	DD16-153	BYA10S15	ED-015		5HK-S1	
C8	5000		B113-8	BPD-005	DD-502	BYA10D5	ED-005	DC525	5HK-D5	
C9	50000		B114-11	BPD-05	DF-503				5HK-S5	
C10	50000		B114-11	BPD-05	DF-503				5HK-S5	
C11	50000		B114-11	BPD-05	DF-503				5HK-S5	
C12	50000		B114-11	BPD-05	DF-503				5HK-S5	
C13	5000		B113-8	BPD-005	DD-502	BYA10D5	ED-005	DC525	5HK-D5	
C14	100		B112-1	BPD-0001	DD-101	L10T1	ED-100	UC-531	5GA-T1	
C15	2000		B113-2	BPD-002	DD-203	BYA10D2	ED-002	DC522	5HK-D2	
C16	2000		B113-3	1467-002	DD-203	1W5D2	ED-002	DC522	1FM-22	
C17	.1	600	B115-2	P688N-1	DF-104	CUB6P1		GEM-601	6TM-P1	
C18	.1	200	B115-1	P288N-1	DF-104	CUB2P1		GEM-201	2TM-P1	
C19	680		B112-6	BPD-00068	DD-681	BYA10T68	ED-680	UC-5368	5GA-T68	
C20	2000		B113-2	BPD-002	DD-202	BYA10D2	ED-002	DC522	5HK-D2	
C21	5000		B113-8	BPD-005	DD-502	BYA10D5	ED-005	DC525	5HK-D5	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	Wollensak PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	200K	½	A140-10	BT-47	A47F-200K	Q13-130X		Volume Tap@ 100K
B	Shaft			Not Req.	FS-3	Not Req.		
R2A	200K	½	A140-11	BT-47	A47F-200K	Q13-130X		Tone Tap@100K
B	Shaft			Not Req.	FS-3	Not Req.		
C	Switch			KB-1 or KR-1*	SWE-12	76-1		
R3	250Ω	2	A140-12				FL-250	Hum Balance Wire Wound
R4	250Ω	2	A140-13					Hum Balance Wire Wound

*Use KR with CRL red label control and use KB with blue label control

CHASSIS—BOTTOM VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	Wollensak PART No.	NOTES
R5	270K		B104-16	
R6	10Ω		B100-5	
R7	10K		B103-2	
R8	10meg		B105-5	
R9	33K		B103-14	
R10	220K		B104-5	
R11	47K		B103-9	
R12	10K		B103-2	
R13	10K		B103-2	
R14	10meg		B105-5	
R15	220K		B104-5	
R16	1800Ω		B102-12	
R17	100K		B104-14	
R18	300Ω 5%		B101-9	
R19	300Ω	4	A106-10	W. W.
R20	180K		B104-20	
R21	82K		B103-15	
R22	91K		B103-16	
R23	470K		B104-9	
R24	1meg		B105-1	
R25	22K		B103-7	
R26	680K		B104-12	
R27	33K		B103-14	
R28	82Ω	2	B100-6	
R29	22Ω		A106-11	
R30	100Ω		A106-12	
R31	100Ω		A106-12	
R32	1500Ω		B102-9	
R33	1500Ω		B102-9	
R34	22K		B103-7	
R35	4.7Ω	2	B100-1	
R36	4.7Ω	2	B100-1	
R37	1800Ω		B102-12	
R38	4700Ω		B102-7	

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	RATING SEC. 4	RATING SEC. 5	REPLACEMENT DATA Wollensak PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117VAC @ .4A	200VAC @ .007A	12.6VAC @ .4A	6.3VAC @ .75A			B130-5						

TRANSFORMER (DRIVER)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA Wollensak PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	25,000 Ω	13,000, 13,000Ω	B131-6							

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA Wollensak PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T3	8800Ω CT	130ΩCT 7Ω	B131-5A							

COILS

ITEM No.	USE	REPLACEMENT DATA Wollensak PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1	Bias Osc.	A-132-10					
L2	Equalizer Coil	A133-8					

SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	REPLACEMENT DATA Wollensak PART No.	QUAM PART No.	NOTES
SP1	5 1/4	PM	7Ω	C160-7	52A21Z7	

PARTS LIST AND DESCRIPTIONS (Continued)

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	Wollensak PART No.	REPLACEMENT DATA
K1	Tone Comp.	1000mmf, 10000mmf, 1500mmf 27K, 200K, 200K, 2.2meg	A177-6	
K2	AF Amp.	100mmf, 470mmf, 3300mmf, 25000mmf, 270K, 270K, 1meg	A177-7	
K3	Tone Comp.	220mmf, 680mmf, 62K, 220K,	A177-8	

RECTIFIER

ITEM No.	RATING CURRENT (Measured)	REPLACEMENT DATA Wollensak PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	SARKES TARZIAN PART No.	NOTES
M1	.068A.	A123-5 ①			M500 ① M150 ①	① Silicon Type ② Selenium Type ③ 2-Reqb. Connect In Series ④ Pigtail Lead Mounting.
M2	.068A.	A123-5 ①		5D94A	M500 ① M150 ①	
M3	.0075A.	A123-4 ②		D-5410 ③ ④	026-16H-Q ④	

FUSES

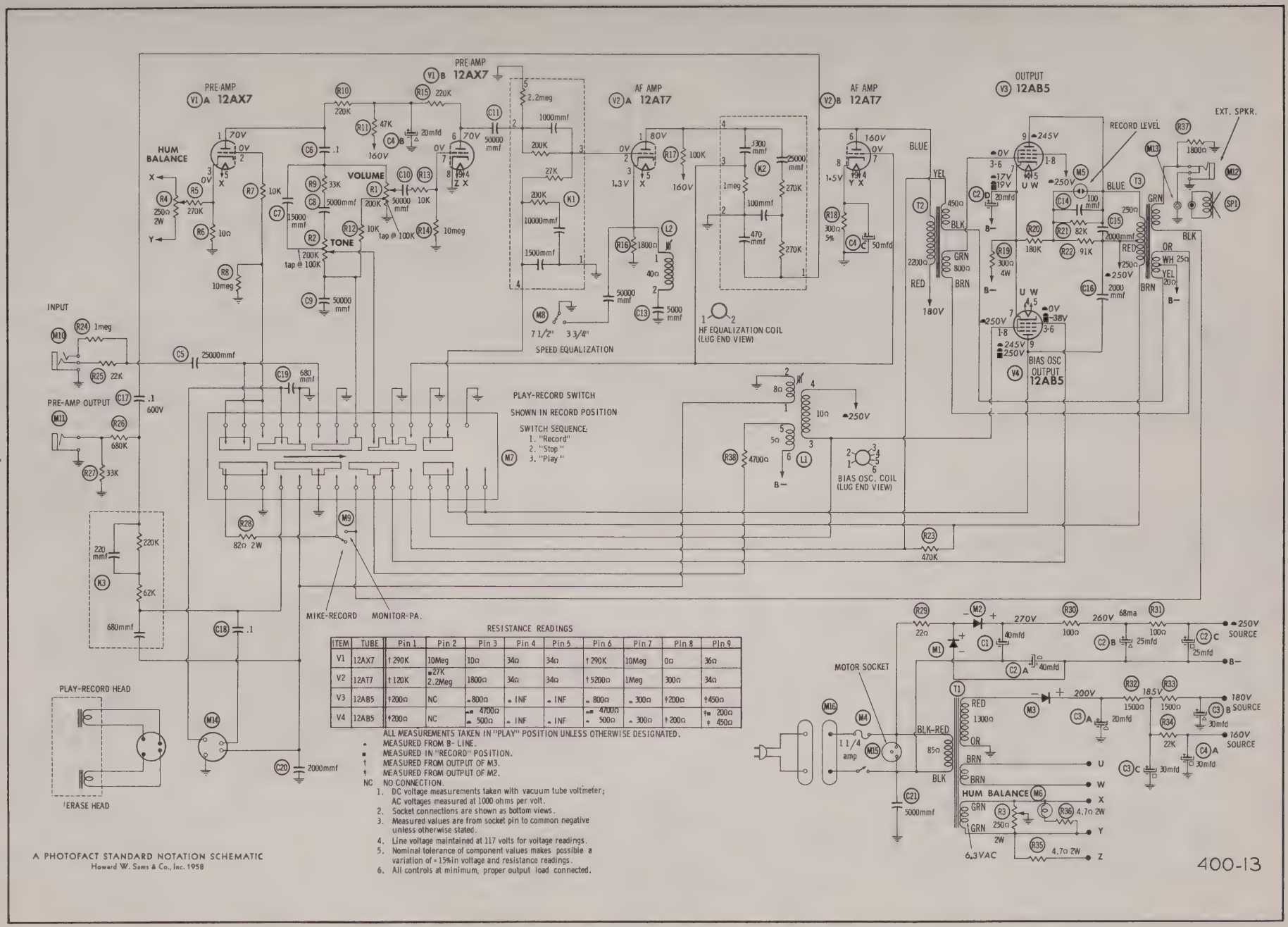
ITEM No.	TYPE	RATING	REPLACEMENT DATA Wollensak PART No. FUSE	Wollensak PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M4	3AG	1 1/4A 125V	A176-1		3151.25 (1 1/4A 125V S/B)		MDV 1 1/4 (1 1/4A 125V S/B)	

MISCELLANEOUS

ITEM No.	PART NAME	Wollensak PART No.	NOTES
M5	Lamp	A121-2	Neon Lamp, Record Indicator NE-45
M6	Lamp	A121-5	Pilot #47
M7	Switch	A141-21	Record-Playback, Slide Type
M8	Switch	A141-22	Speed Equalization, Leaf Type
M9	Switch	A141-23	Slide Type
M10	Jack	A174-10	Input
M11	Jack	A174-14	Preamp Output
M12	Jack	A174-5	Speaker Output
M13	Socket	A174-8	Speaker
M14	Socket	A174-4	Head
M15	Socket	A174-23	Motor
M16	Socket	A174-6	Power

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors
Power Cord ..... Use BELDEN No. R-794 (6½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)..... Use BELDEN No. 8401
Phono Pick-up Arm Cable ..... Use BELDEN No. 8430 (Two Conductor - Twisted)



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AX7	†290K	10Meg	10Ω	34Ω	34Ω	†290K	10Meg	0Ω	36Ω
V2	12AT7	†120K	▪27K 2.2Meg	1800Ω	34Ω	34Ω	†5200Ω	1Meg	300Ω	34Ω
V3	12AB5	†200Ω	NC	▫800Ω	▫ INF	▫ INF	▫800Ω	▫300Ω	†200Ω	†450Ω
V4	12AB5	†200Ω	NC	▪▫ 4700Ω ▫ 500Ω	▫ INF	▫ INF	▪▫ 4700Ω ▫ 500Ω	▫300Ω	†200Ω	†▪ 200Ω † 450Ω

ALL MEASUREMENTS TAKEN IN "PLAY" POSITION UNLESS OTHERWISE DESIGNATED.

- ▫ MEASURED FROM B- LINE.
- ▪ MEASURED IN "RECORD" POSITION.
- † MEASURED FROM OUTPUT OF M3.
- † MEASURED FROM OUTPUT OF M2.
- NC NO CONNECTION.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1958

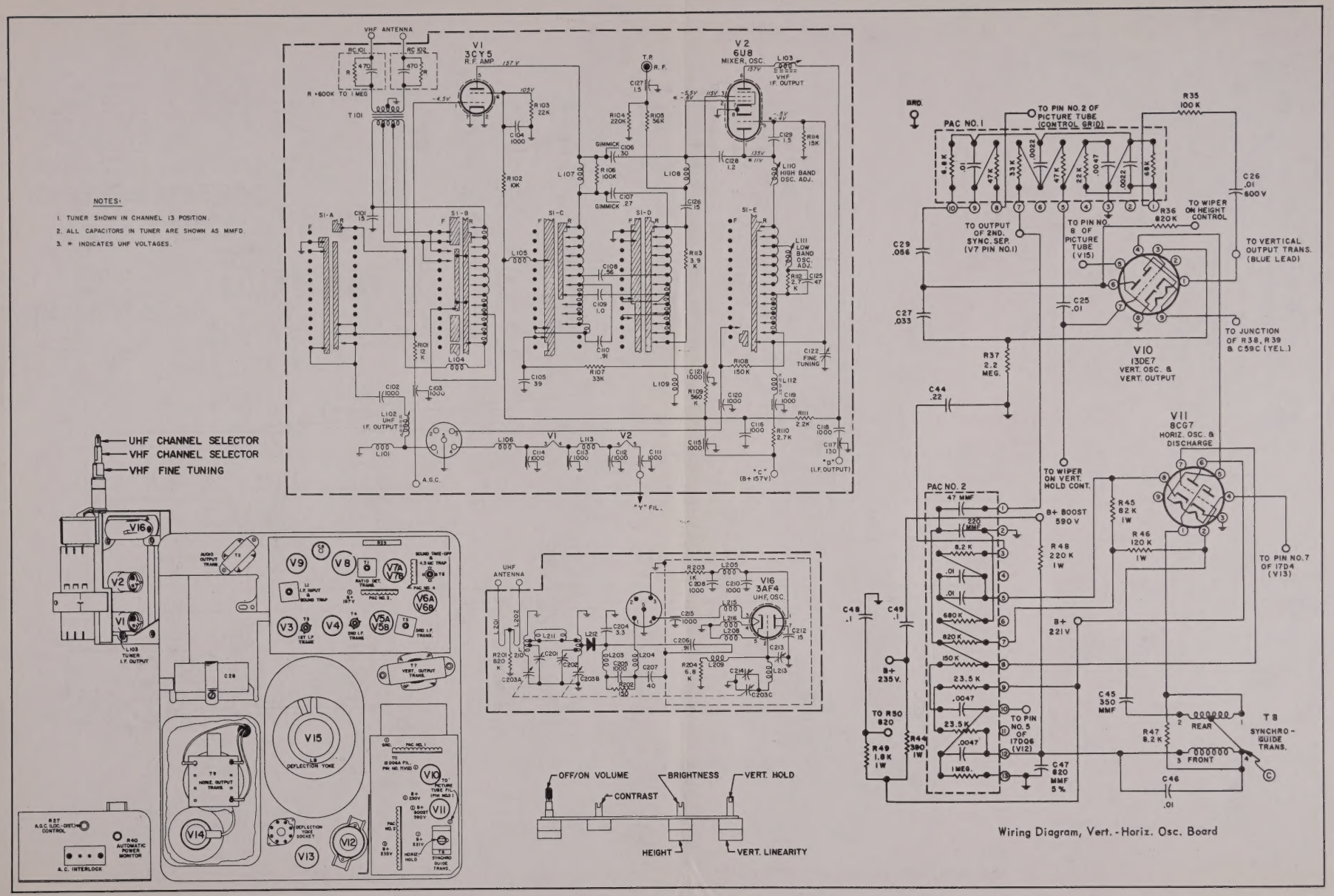
400-13

SCHEMATIC DIAGRAM.

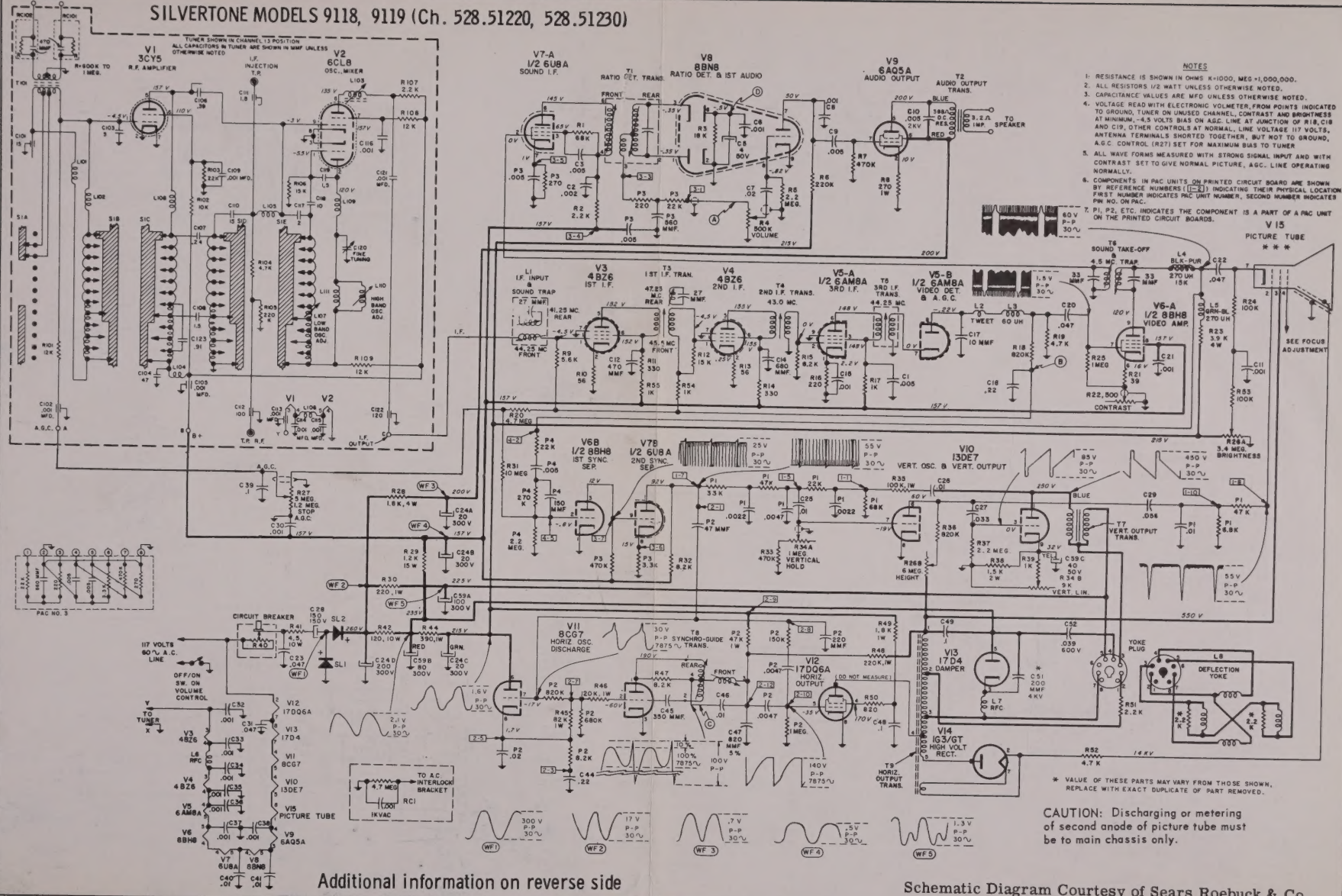
MECHANICAL PARTS LIST

Ref. No.	Part No.	Description
1	A9-14370	Screw, #6-32 x 7/32"
2	C2-14259	Head Cover Casting
3	A9-14368	Screw, #4-48 x 1/4"
4	B2-14255	Clean Out Cover Casting
5	C3-14288	Cover Plate
6	C2-14257	Odometer Bezel Casting
7	A9-14369	Screw, #6-32 x 7/32"
8	R1-14190	Front Screen Group
9	A15-14461	Spindle Cap
10	P-1428	Flat Washer
11	A1-14211	Rewind Spindle & Tire Assembly (Includes Item 12)
12	A30-11094	Spindle Cup Tire
13	A30-14492	Counter Drive Belt
14	A8-14441	Phenol Washer
15	A-15-14461	Spindle Cap
16	P-1428	Flat Washer
17	A1-14227	Spindle Cup & Hi-Speed Drum Ass'y. (Includes Item 18)
18	A30-11094	Spindle Cup Tire
19	TR-7524	"E" Ring, 1/4" Shaft
20	A13-11200	Brake Arm Spring
21	A1-14214	Brake Arm & Pin Ass'y. — Left
22	A15-14064	Brake Arm Roller
23	A13-14415	Brake Roller Leaf Spring
24	A1-14213	Brake Arm & Pin Ass'y. — Right
25	A15-14064	Brake Arm Roller
26	A13-14415	Brake Roller Leaf Spring
27	TR-7524	"E" Ring, 1/4" Shaft
28	A3-14321	Brake Release Link
29	A3-14321	Brake Release Link
30	TR-7524	"E" Ring, 1/4" Shaft
31	A1-14191	Rear Slide Cam Ass'y.
32	A3-14322	Right Scissors Detent
33	A13-11203	Spring
34	A3-14292	Left Scissors Detent
35	A13-14409	Spring
36	B1-14215	Rewind Spindle & Arm Ass'y.
37	TR-7604	Rewind Spring
38	A1-14208	Counter Worm Shaft & Bracket Ass'y.
39	A15-14397	Counter Worm Gear
40	A8-14436	Washer
41	TR-7526	Grip Ring, 3/16" Shaft
42	A1-14237	Counter Assembly
43	A14-14431	#8-32 x 5/32 Pan Head Screw
44	A14-12187	#8-32 x 1/4" Phillips P.H.S.(Sems)
45	C1-14198	Top Mechanism Plate Ass'y. (Riveted)
46	A9-11888	"E" Ring, 3/16" Shaft
47	A13-14424	Pressure Roller Tension Spring
48	A1-14243	Function Switching Arm Ass'y.
49	A13-14420	Instant Stop Brake Spring
50	A9-11888	"E" Ring, 3/16" Shaft
51	A15-14451	Function Roller
52	A15-14450	Slide Roller
53	A9-11888	"E" Ring, 3/16" Shaft
54	A3-14272	Instant Stop Brake Arm
55	TR-7521	"E" Ring, 5/32" Shaft
56	TR-7517	Fibre Washer
57	A30-14068	Pressure Roller Assembly
58	A9-6501	"E" Ring, 3/32" Shaft
59	A15-14450	Slide Roller
60	A1-14580	Instant Stop Arm & Stud Ass'y.
61	TR-7922	Pressure Roller Arm Ass'y.
62	B3-14268	Hi-Speed Forward Lever
63	A9-11888	"E" Ring, 3/16" Shaft
64	B3-14265	Function Key Bracket
65	B15-14442	Play Key
66	B15-14443	Record Key
67	B15-14444	Stop Key
68	A4-14347	Key Shaft
69	A9-11888	"E" Ring, 3/16" Shaft

Ref. No.	Part No.	Description
70	A14-1057	#3-48 x 1/8" Screw
71	A13-14320	Head Hold Down Spring
72	A16-14464	Head Insulator
73	C161-1	Play-Record-Erase Head
74	TR-7429	#4-48 Set Screw (Head Adj.)
75	A1-14218	Record Pressure Pad Ass'y.
	TR-7818	Pressure Pad, Felt
76	TR-7610	Record Pad Spring
77	TR-7916	Erase Pressure Pad Ass'y.
	TR-7818	Pressure Pad, Felt
78	TR-7615	Erase Pad Spring
79	A1-14219	Two Speed Knob Ass'y.
80	A9-11888	"E" Ring, 3/16" Shaft
81	A9-14383	Rollpin, 1/16 x 3/4"
82	A4-14323	Two Speed Arm Shaft
83	A13-12124	Detent Spring
84	A9-10874	Steel Ball
85	TR-7605	Idler Drive Spring (7 1/2 ips.)
86	A9-11888	"E" Ring, 3/16" Shaft
87	A8-10472	Washer
88	A9-10960	Speed Nut
89	A1-14204	Idler Slide Assembly
90	B1-14207	Idler Assembly
91	A3-14281	Speed Change Arm (7 1/2 ips.)
92	A9-11888	"E" Ring, 3/16" Shaft
93	A13-14421	Hi-Speed Idler Spring
94	A9-10960	Speed Nut
95	A9-11888	"E" Ring, 3/16" Shaft
96	A8-10472	Washer
97	A1-14204	Idler Slide Assembly
98	B1-14207	Idler Assembly
99	A13-14423	Brake Release Spring
100	B1-14209	Hi-Speed Slide & Key Return Lever Assembly
101	A9-11888	"E" Ring, 3/16" Shaft
102	TR-7602	Key Return Lever Spring
103	A8-14481	Washer
104	TR-7817	Take-Up Clutch Felt
105	A1-14513	Clutch Plate & Felt Ass'y.
106	TR-7617	Clutch Plate Spring
107	A1-14228	Take-Up Pulley Ass'y.
108	TR-7520	"E" Ring, 1/8" Shaft
109	TR-7809	Take-Up Belt
110	A1-14193	Flywheel & Hub Ass'y.
111	TR-7513	Flat Washer, Steel
112	TR-2431	Steel Ball
113	B1-14247	Cam Actuating Stud Lever Ass'y.
114	A4-14578	Motor Pulley
115	A9-14388	Felt Washer
116	B1-14206	Slow Idler Assembly
117	A1-14205	Slow Idler Slide Ass'y.
118	A13-14418	Slow Speed Idler Spring
119	A9-10960	Speed Nut
120	P-1428	Washer
121	A9-11888	"E" Ring, 3/16" Shaft
122	A3-14282	Speed Change Arm (3 3/4 ips.)
123	A9-11888	"E" Ring, 3/16" Shaft
124	A1-14603	Motor & Plug Ass'y., 115 volts, 60 cycle
125	TR-7524	"E" Ring, 1/4" Shaft
126	TR-7513	Flat Washer, Steel
127	A9-14499	Motor Fan
128	A9-12098	Rollpin 1/16 x 7/16"
129	A15-14446	Slow Speed Switch Cam
130	A9-11888	"E" Ring, 3/16" Shaft
131	B3-14262	Take-Up Actuating Lever
132	A13-14417	Take-Up Lever Spring
133	A9-11888	"E" Ring, 3/16" Shaft
134	A3-14270	Key Return Lever
135	A4-14341	Key Return Lever Shaft
136	A9-12097	Rollpin, 1/16 x 3/8"
137	C1-14203	Bottom Mechanism Plate Ass'y.


NOTES:
1. TUNER SHOWN IN CHANNEL 13 POSITION.
2. ALL CAPACITORS IN TUNER ARE SHOWN AS MMFD.
3. * INDICATES UHF VOLTAGES.
VHF ANTENNA
V1 3CY5 R.F. AMP
V2 6U8 MIXER, OSC.
T.R R.F.
VHF I.F. OUTPUT
R +600K TO 1 MEG
A.G.C.
"Y" FIL.
"C" (B+ 157V)
"D" (I.F. OUTPUT)
UHF CHANNEL SELECTOR
VHF CHANNEL SELECTOR
VHF FINE TUNING
UHF ANTENNA
V16 3AF4 UHF, OSC.
OFF/ON VOLUME
CONTRAST
BRIGHTNESS
VERT. HOLD
HEIGHT
VERT. LINEARITY
GRD.
PAC NO. 1
TO PIN NO. 2 OF PICTURE TUBE (CONTROL GRID)
TO OUTPUT OF 2ND. SYNC. SEP. (V7 PIN NO. 1)
TO PIN NO. 8 OF PICTURE TUBE (V15)
TO WIPER ON HEIGHT CONTROL
TO VERTICAL OUTPUT TRANS. (BLUE LEAD)
TO JUNCTION OF R38, R39 & C59C (YEL.)
V10 13DE7 VERT. OSC. & VERT. OUTPUT
V11 8CG7 HORIZ. OSC. & DISCHARGE
TO WIPER ON VERT. HOLD CONT.
PAC NO. 2
8+ BOOST 590 V
8+ 221 V
8+ 235 V.
TO R50 820
TO PIN NO. 5 OF 17DQ6 (V12)
TO PIN NO. 7 OF 17D4 (V13)
T8 SYNCHRO-GUIDE TRANS.
REAR
FRONT
Wiring Diagram, Vert.-Horiz. Osc. Board

SILVERTONE MODELS 9118, 9119 (Ch. 528.51220, 528.51230)



NOTES

1. RESISTANCE IS SHOWN IN OHMS K=1000, MEG=1,000,000.
2. ALL RESISTORS 1/2 WATT UNLESS OTHERWISE NOTED.
3. CAPACITANCE VALUES ARE MFD UNLESS OTHERWISE NOTED.
4. VOLTAGE READ WITH ELECTRONIC VOLMETER, FROM POINTS INDICATED TO GROUND. TUNER ON UNUSED CHANNEL, CONTRAST AND BRIGHTNESS AT MINIMUM, -4.5 VOLTS BIAS ON A.G.C. LINE AT JUNCTION OF R18, C18 AND C19, OTHER CONTROLS AT NORMAL, LINE VOLTAGE 117 VOLTS, ANTENNA TERMINALS SHORTED TOGETHER, BUT NOT TO GROUND, A.G.C. CONTROL (R27) SET FOR MAXIMUM BIAS TO TUNER
5. ALL WAVE FORMS MEASURED WITH STRONG SIGNAL INPUT AND WITH CONTRAST SET TO GIVE NORMAL PICTURE, A.G.C. LINE OPERATING NORMALLY.
6. COMPONENTS IN PAC UNITS ON PRINTED CIRCUIT BOARD ARE SHOWN BY REFERENCE NUMBERS (P-1). INDICATING THEIR PHYSICAL LOCATION. FIRST NUMBER INDICATES PAC UNIT NUMBER, SECOND NUMBER INDICATES PIN NO. ON PAC.
7. P1, P2, ETC. INDICATES THE COMPONENT IS A PART OF A PAC UNIT ON THE PRINTED CIRCUIT BOARDS.

* VALUE OF THESE PARTS MAY VARY FROM THOSE SHOWN, REPLACE WITH EXACT DUPLICATE OF PART REMOVED.

CAUTION: Discharging or metering of second anode of picture tube must be to main chassis only.

Additional information on reverse side

Schematic Diagram Courtesy of Sears Roebuck & Co.